THE LANCET

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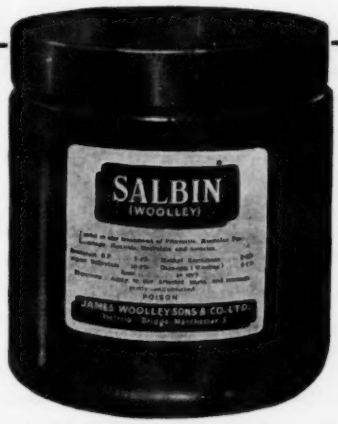

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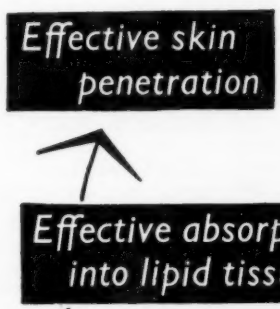

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* (1948) *Comptes rend. Soc. de Biol.*, **142**, 819.

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REFERENCES:

Oral Therapy for Diabetics with Tuberculosis, *Brit. Med. J.*, 1958, **1**, 220

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Dtsch. med. Wschr., 1957, **82**, 1513-1592

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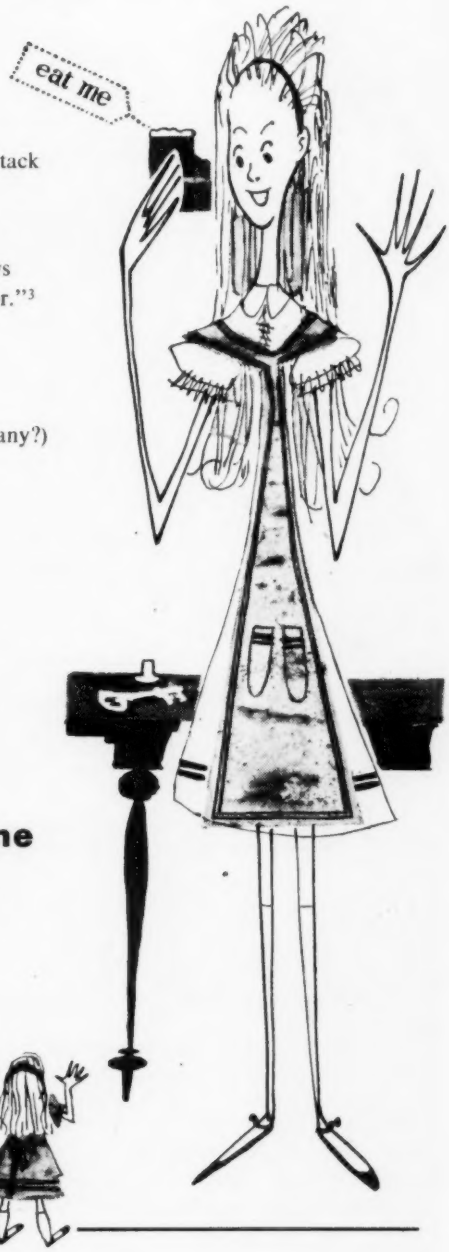
[1] *J. nerv. ment. Dis.* (1952) **116**, 346 [2] *Lancet* (1956) **1**, 794
[3] *Canad. med. Ass. J.* (1955) **73**, 701



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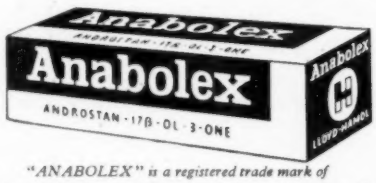

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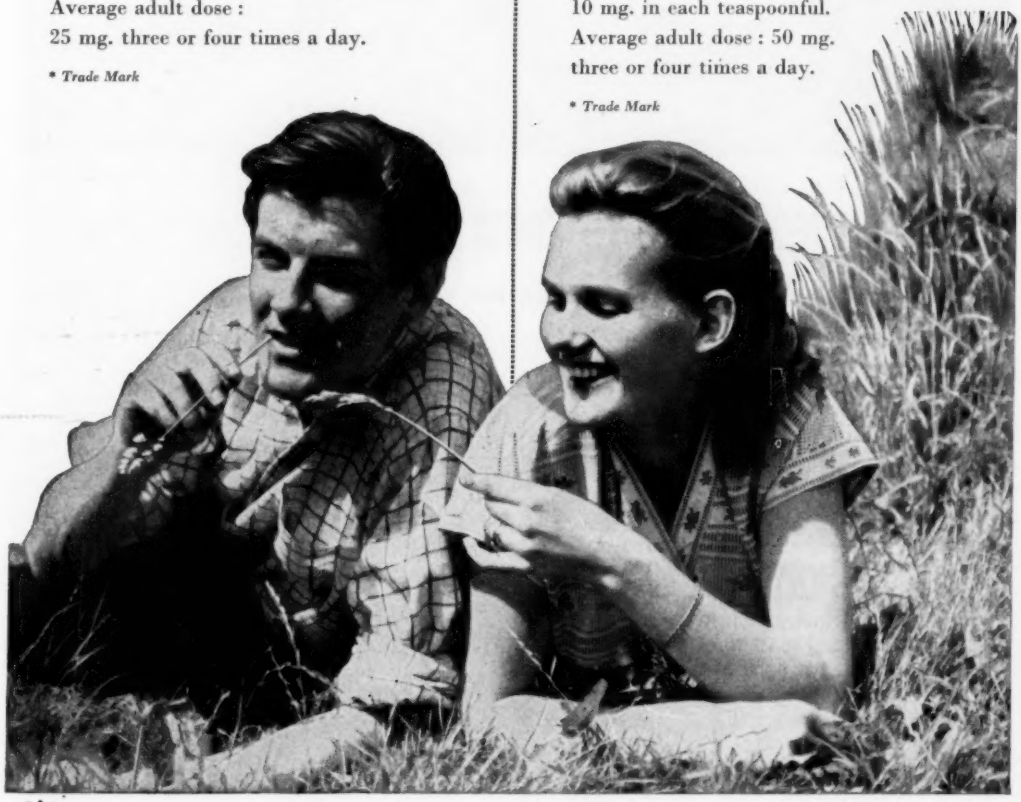

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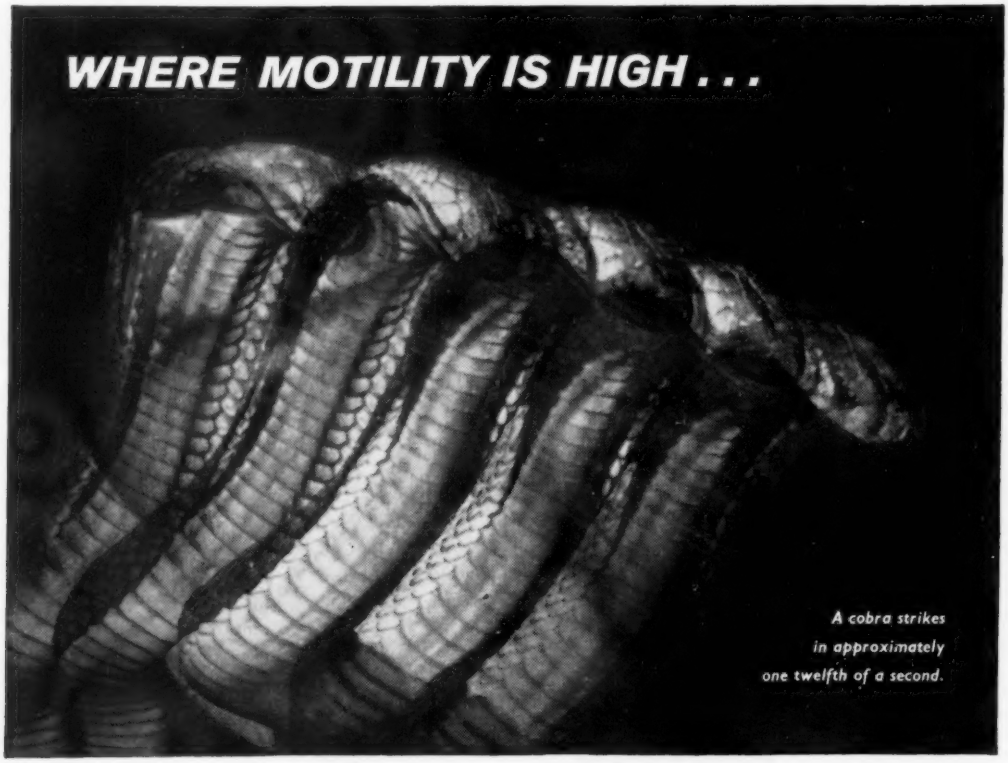

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Reference: *Lancet (1956) i.,537.*
Lancet (1955) i.,234.
Proc. S.M. Mayo Clinic. Vol. 32 No. 22, 30, 10, 1957.

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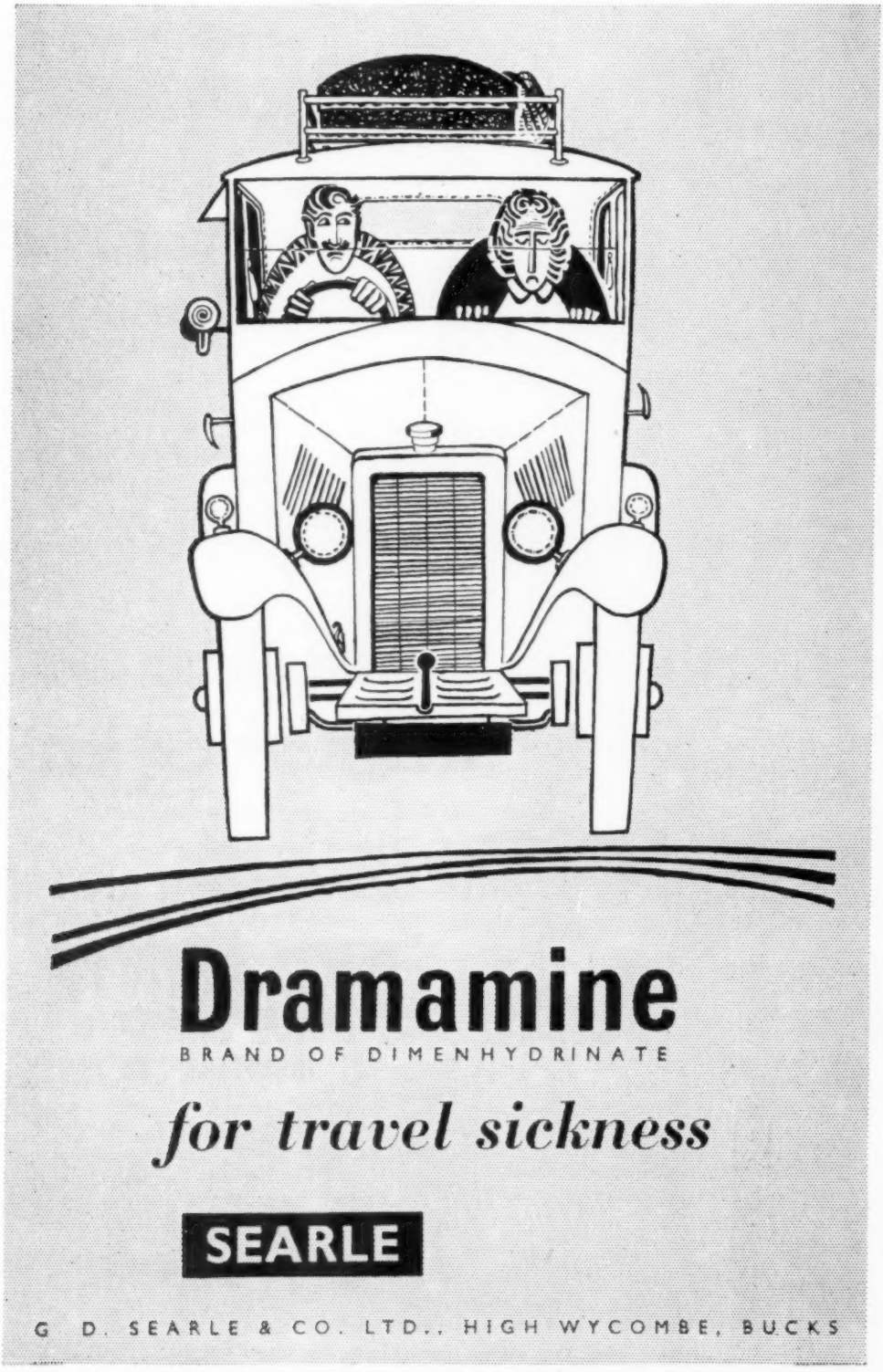
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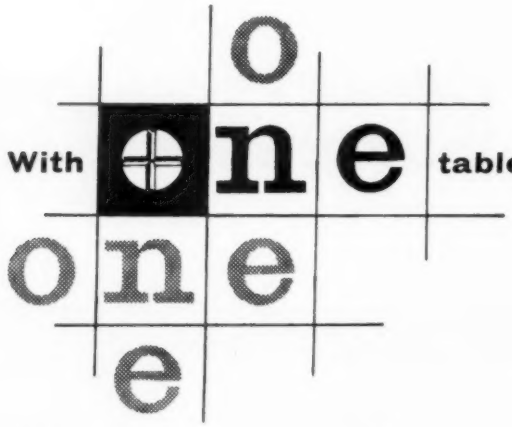

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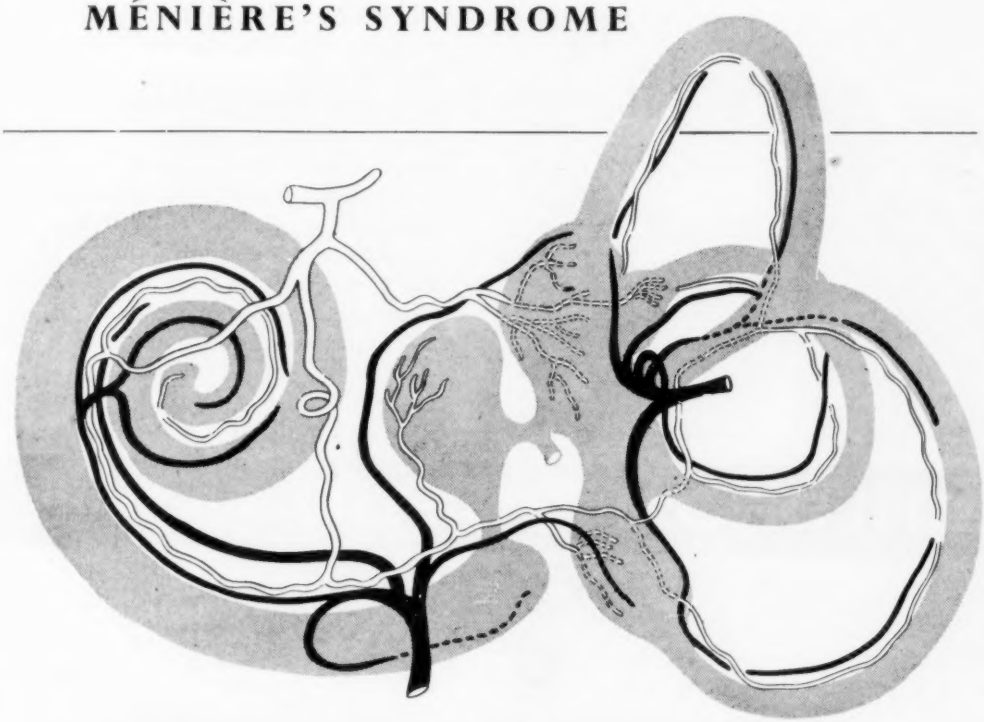

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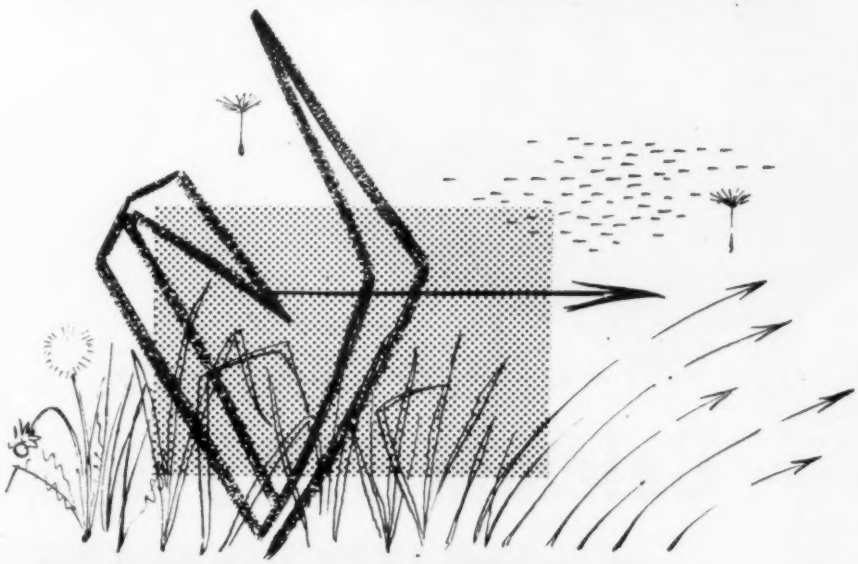

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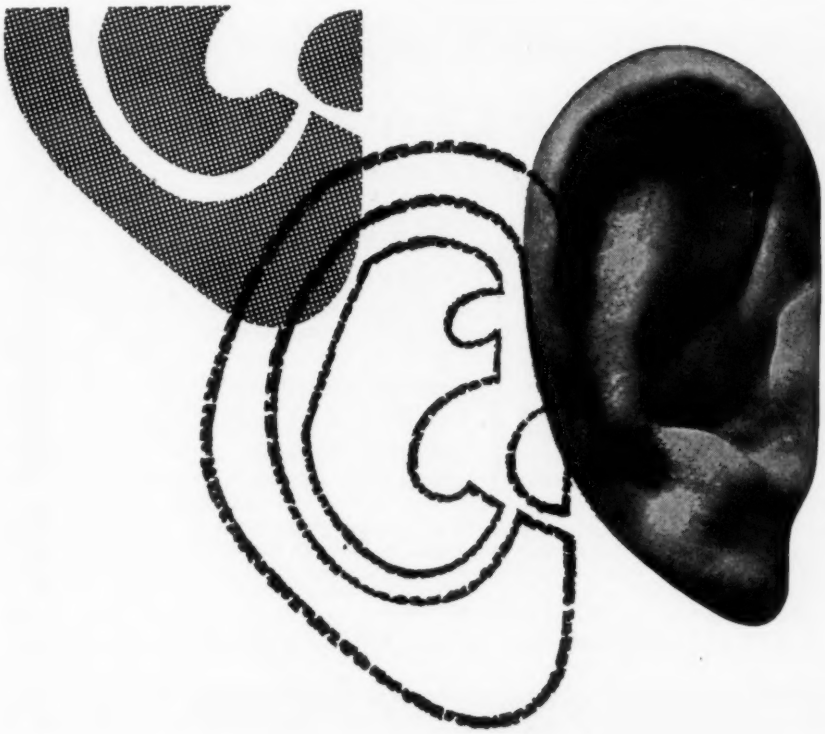

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FEAR IN HOSPITAL PRACTICE
SOME ADVANTAGES OF HOME CARE *

E. M. BLUESTONE
M.D. Columbia
CONSULTANT, MONTEFIORE HOSPITAL, NEW YORK CITY

"The fear of death is more to be dreaded than death itself."—PUBLIUS SYRUS.

ONE of the chief characteristics of good physical and mental health is the ability to minimise the effects of fear. As health forsakes a man, the everyday fear associated with normal living is intensified. It makes a bad situation worse and the patient needs help in dealing with it. The complicating and enervating dread in a sick man may nullify any treatment that does not take into account his mental reaction to his illness. Yet too often this is overlooked, minimised, or even disregarded.

The patient who seems apprehensive before, during, or after diagnosis or therapy (whether or not he is in the confidence of his doctor, but most often when he is not) is, for all practical purposes, under the influence of fear. Because fear, unlike worry or anxiety, both of which it includes, requires an antagonist to evoke it, the word is seldom found in the terminology of physical disease, as if the doctor were afraid that his prestige might somehow be impaired by the mention of it. But nobody has the right to be offended by the presence of fear in his patient. Illness is a humiliating experience, and the more critical the patient's condition (up to, and including, the point of dying) the more it offends his dignity. It is normal for a person to glory in his strength; and when this precious asset leaves him, he fears that it may not return, or that he may have to pay a crippling price for its return. Even irritability or impatience during illness has an element of fear in it. Courage depends on the will to regain the health that has been lost, and the sick man is fearful that he may not succeed, or be helped to succeed, in this struggle.

Fear is aggravated when the patient is kept in the dark about his condition, or when he is left too long with his own thoughts. It is by no means restricted to the literate, but may strike most heavily the less enlightened, the ignorant and the superstitious. One has to be extremely careful in distinguishing "exaggerated" fear from "justifiable" fear. Age is a factor, since older people are closer to death and very few of us can face oblivion calmly. Again, the greater the patient's weakness—and this is true at any age—the greater his fear; which will be increased, too, if there is danger of him or his family being later reduced to social dependence. The only patient who is entirely free of fear is the unconscious patient. Helplessness, inability to manage one's own affairs, and the need to be babied during illness all have their depressing effect. Vespasian remarked that an Emperor should die standing!

In contrast with physical pain fear lies beneath the surface; and too often in hospital its existence is denied or played down. Physical signs, such as pain, fever, shock (which, in some respects, is a physical manifestation of intense fear), unconsciousness, or hæmorrhage, compel a medical response. Those which can be suppressed or contained (at some cost) may go unmollified or untended though the damage which they cause may be as great, and perhaps less endurable. Illness is always a traumatic experience. It leaves its mark and sometimes this is an irreversible scar.

An analysis of fear is an easy exercise in a hospital if only because of the abundance of clinical material. In its most challenging form it is to be found in the newly admitted patient and in the one awaiting his summons to the operating-table. It follows no established psychological pattern and is aroused by any stimuli which, rightly or wrongly, are interpreted as a threat to life or comfort.

Kind Words as Therapy

Here is a serious hospital problem which must be identified early and solved for each patient. If the doctor moves, or stands still, on the assumption that his patient's mental state will somehow improve so long as his physical ailment is being relieved, the patient must bear his deprivation as best he can. To greet a new patient, or any patient at any time of his illness, with impersonal silence that may be misinterpreted as lack of sympathy, is a self-defeating kind of neglect. The doctor must bear in mind that the patient who is before him is not a cold figure, or exactly the one who was included in past statistics of the same illness.

My mind goes back to the way the late George W. Crile used to prepare a patient for thyroidectomy. He knew that the patient was his best ally in the surgical victory which he was planning, and he did everything in his power to win the patient over and put his mind at rest before operation. The busy surgeon, the impatient surgeon, the man who expects his word (even when it cannot be heard) to be taken unquestioningly as law by the patient and his fretful family, the one who deputes such intimate duties on the assumption that confidence—another antidote to fear—can be won that way, are still among us as are, indeed, their counterparts in the medical specialties. Silence can be very harmful at times, particularly when it is wielded by those who are expected to carry healing in their hands. It may well be interpreted by the disturbed mind of the patient as a sign of therapeutic weakness; and, if a mistake has been made in assigning such a doctor to him, what is he to do? As for the administration of tranquillising drugs as a substitute for the spoken word, this resembles the administration of antibiotics while neglecting surgical asepsis. Actually it may be easier to administer therapy independently of the psychiatrist for such a secondary complication as fear than for the primary physical disability, and failure to cope successfully with the disability is no excuse for leaving the patient's fear untreated. We must be on our guard lest medical negativism and the tendency to let Nature take its course should breed callousness—the callousness evident in anyone who turns his back on an apprehensive patient. You cannot help a drowning man from a distance—you must come close to him.

Every conscientious doctor can bear witness to the exhilarating effect on a patient when the kind word is spoken at the strategic moment. If a patient can be told the good news in advance so much the better. There is no need to wait for statistical evidence based on a series of cases before applying remedies which are as potent as the balm of Gilead. Those who serve the sick, must

* Based on an address on May 13 to the Bristol division of the British Medical Association.

have insight as well as foresight, and evaluate each case psychologically, on its merits. For this they need time, patience, sympathy, and cooperation from the hospital authority, as well as encouragement. Their prescriptions are as valuable in overcoming the symptom of fear as in overcoming basic and original symptoms of the illness. The surgeon who never sees his patient in the conscious state after an operation may have performed a mechanical job brilliantly, but the patient will be relieved of his fear only by humane reassurance and personal interest. Though statistics will not help a man who is dying, kind words will do so, and they should be used liberally. Enough is seldom done.

In hospitals today we see growing interest in the patient as an individual—more privacy; " rooming-in " for mothers; more liberal social service; easier hospital visiting hours; more information services; rehabilitation schemes, and the like. But the problem in essence is how to give each patient the comforting feeling that he has little to fear because everything known to science and humanity has been mobilised for his special benefit. Where there is hope it must be stimulated; where there is no hope it must be simulated. Never laugh at a placebo; emotion sometimes plays as big a role in illness as logic, and must be treated with equal therapeutic skill even if the remedy is only palliative.

Hospital and Home

The situation is complicated by another kind of fear which sometimes overtakes those who look after the patient whether on their own timorous account or because of the demands which the sick man may make on their time and energy. Fear is felt not only by the patient but to some extent by the doctor who prescribes for him, by the social worker who supplements his medical care with information on such subjects as fear, by the administrators of the hospital who may have difficulty in living up to its ideals, and (last but by no means least) by the worried and anxious family of the patient.

Removing a patient from his own home, however modest it may be, and transferring him to a hospital where he must compete with other ill, and possibly more gravely ill, people for attention—where, since he is outnumbered, he feels himself in a minority—is not always therapeutic. We must remember that every mother is a good nurse but not every nurse is a good mother. When a patient enters the hospital he faces the unknown. He is a stranger among strangers, exposed to them as they are to him, in all their weaknesses, demands, and variable requirements. In this case it is not true that " misery likes company ". The doctor's first thought, and indeed the first thought of the hospital should be, wherever his illness allows it, to keep the patient in his own home, supported by a subsidy from the community (if need be) and in any case by the continued interest and help of the hospital. The impersonal, mechanical, routinised institution of collective care is more likely to arouse fear than to relieve it, and too often the fear is justified. The multiple-bed open ward in hospitals is an invitation to oversight and neglect. It encourages overt selectivity in a busy doctor, or one with limited interests. There is wisdom in Libman's suggestion that every hospital should have a rule that a staff doctor during his rounds should sit down for at least one minute by the bedside of each patient.

These are the compelling reasons which prompted me to plan and establish a modern extramural hospital service to supplement the intramural service.[1] Home care controls and limits fear while respecting the dignity and essential privacy of the individual. It also saves hospital beds for more intensive use by those who cannot do without them and reduces the total community bill for medical care. When medical care is properly apportioned, between hospital and home, the advantages to the patient, his doctor, and the hospital are legion. Lessons in individual care are learnt more rapidly and applied within the hospital proper.

The hospital has reason to fear the consequences for the patient of some of its inadequacies. It is too often short of staff—and particularly of intelligent, considerate, and helpful staff. It is often short of vital space. It deals with patients en masse, in open wards; and large numbers increase the chances of error. It deprives the patient of privacy and subordinates him to the needs of his neighbours in the same sickroom (and outside it). It can seldom provide him with the food to which he is accustomed, or permit his relatives free entry to his bedside. It must too often deny him information about his condition, for lack of time when serving large numbers and not often because it does not know what to tell him. From the point of view of too many hospitals, the best patient is the one who is admitted with a quickly curable condition, accepts everything without question, and does not complain.

A good home-care service based on a hospital can do much to relieve, if not to abolish, these shortcomings. Furthermore it allows the hospital doctors and the family doctors to work together. The family doctor holds many keys to the solution of his patient's problem, and he should have the benefit of hospital facilities (staff and equipment) in his patient's home wherever this is preferable and practicable. The hospital staff is at its best with the more technical problems of medical care which require the transfer of the patient to the hospital. The family doctor should be welcome on both sides of the hospital wall and be accepted as a member of the team looking after patients.

* * *

Hospitals must advance with medical and social science. They must deal with their own built-in handicaps and, in doing so, help to overcome fear from whatever source. We know now how this can be done. The distant château-hospital fortified against intrusion belongs to the past.

1. Bluestone, E. M. *J. Amer. med Ass.* 1954, **155**, 1379.

" . . . Many girls who have perfect feet at their ten-year-old examination have severe deformities by the time they reach school leaving age, many of such a degree that they may eventually require operative treatment. The present day fashion of continued all day wear of shoes of a ' slip on ' or ' casual ' type, which must of necessity be too small so that they can stay on, or cause cramping of the toes to keep them on can during these formative years cause hallux valgus, painful bunions and curling under of the toes, sometimes of such a degree that the nails are walked on. . . . From an economic aspect only it is doubtful if in years hence the country can afford comparatively young, middle aged, and elderly women hobbling round on deformed feet. The strange fact is that the young girl of today, who would laugh at a whale bone corset of Victoria days, treats her feet in the same way as her great-great-grandmother treated her waist."—Dr. R. G. DAVIES, annual report on the school health service, Huddersfield, 1957.

THROMBOSIS OF THE INTERNAL CAROTID ARTERY

SIMULATING AN INTRACRANIAL SPACE-OCCUPYING LESION

EDWIN CLARKE
M.D. Durh., M.R.C.P.
LATE LECTURER IN NEUROLOGY,
POSTGRADUATE MEDICAL SCHOOL OF LONDON, W.12

PHILLIP HARRIS
F.R.C.S.E., M.R.C.P.E.
NEUROSURGEON, DEPARTMENT OF SURGICAL NEUROLOGY,
THE ROYAL INFIRMARY, EDINBURGH

ALTHOUGH thrombotic occlusion of the internal carotid artery was described almost three hundred years ago (Willis 1664), its frequency and clinical importance are only now being established, owing to the introduction of cerebral angiography and to wider awareness of the disease. In five years Webster et al. (1956) encountered 70 cases in clinical practice, whereas Johnson and Walker (1951) found only 100 examples in the literature of the preceding fifteen years; Sastrasin (1957) has surveyed graphically this increasing incidence over twenty-three years in a large neurosurgical clinic. Furthermore, Panter (1957) reports 5 cases amongst 306 cerebrovascular accidents in almost 15,000 hospital admissions during a six-year period, and Fisher (1954) has recently found 45 examples in the routine necropsy material of two years.

The clinical picture of internal carotid thrombosis is now well known, but certain aspects of it deserve more detailed consideration. Thus an important mode of presentation is that which closely resembles an intracranial space-occupying lesion. We here report 5 such cases.

Case-reports

Case 1.—A painter's manager, aged 39, was first admitted to the National Hospital, Queen Square, on Dec. 9, 1954, under the care of Dr. E. A. Carmichael (N.H. 56282). Six months previously he had been admitted to another hospital because of major seizures, headache, and abdominal pain of recent onset. He was confused, but the only neurological signs were a right extensor plantar response and an equivocal one on the left. The cerebrospinal fluid (C.S.F.) pressure was 120 mm. of water, the protein content 125 mg. per 100 ml., and the cell content 2 lymphocytes per c.mm. The electroencephalogram (E.E.G.) showed an area of gross abnormality over the left hemisphere with depression of alpha activity over the post-central region. A parietal burr-hole failed to reveal any lesion, but the C.S.F. in the left lateral ventricle contained 500 mg. of protein per 100 ml. and 7 cells per c.mm. The blood Wassermann reaction (W.R.) on one occasion only was weakly positive, and a course of intramuscular penicillin was given. He improved somewhat, but two months later a right subphrenic abscess was detected and drained; two months afterwards a discharging abdominal sinus was still present. Two weeks before admission to the National Hospital increasingly severe headaches returned, and four days before admission he had several generalised convulsions.

Examination.—The patient was drowsy and there was evidence of considerable weight-loss. Apart from bilateral papillœdema, more obvious on the left, the nervous system was normal. A ventriculogram was normal, but films taken twenty-four hours later showed that the right lateral ventricle was slightly larger than the left. The E.E.G. suggested a deep, central lesion.

Course.—On Dec. 24, 1954, it was clear that the subphrenic abscess had returned, and he was transferred for surgical treatment. He was readmitted five weeks later, having had periods of maniacal behaviour necessitating retention in an observation ward. Two days before his return, a right hemiplegia and aphasia appeared and were progressive. He had gradually become comatose. He had decerebrate rigidity with bilateral papillœdema, fixed dilated pupils, variable spasticity of the limbs, and bilateral extensor plantar responses. Ventriculography showed a raised C.S.F. pressure and ventricular displacement to the right, indicating a large left frontal space-occupying mass. A left frontal burr-hole with needle biopsy yielded only necrotic brain tissue, and the patient died twenty-four hours later.

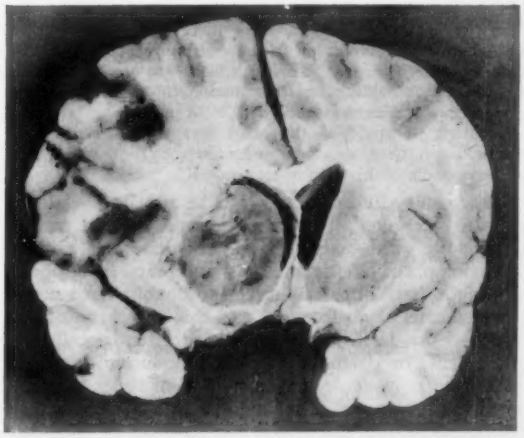

Fig. 1.—Case 1: brain section (viewed from behind), swollen left cerebral hemisphere.

Necropsy

The left internal carotid artery was completely blocked at its origin by an old organising clot, which, with the addition of a more recent clot, extended distally to the intracranial divisions of the vessel. At the bifurcation of the right common carotid artery an organising saddle-shaped clot was found, blocking the external but not the internal carotid artery.

Fig. 2—Case 1: tentorial grooving of swollen left cerebral hemisphere and terminal brain-stem hæmorrhage.

The vertebral arteries were normal.

In the left cerebral hemisphere there was extensive pale and hæmorrhagic infarction in the distribution of the middle cerebral artery (fig. 1). This hemisphere was greatly swollen, and there was evident uncal herniation (fig. 2). The right cerebral hemisphere was normal.

The left ventricle of the heart was moderately hypertrophied, and there was moderate atheroma of the aorta. There were remnants of the subphrenic abscess.

The whole clinical picture can be explained by progressive occlusion of the left internal carotid artery, terminating with complete obstruction and further infarction of the already affected left cerebral hemisphere. The right external carotid artery no doubt shared in the terminal arterial obstruction, and this may have contributed to the death by compromising essential collateral channels. The diagnosis of carotid occlusion, however, was made only at necropsy, and at all times a space-occupying lesion was thought to be present. In view of the known focus of infection it was reasonable to postulate the presence of a cerebral abscess. An angiogram, however, would have indicated the diagnosis.

Case 2.—A watchman, aged 58, was admitted to the Royal Infirmary, Edinburgh, on Dec. 14, 1953. A year previously he had had four "blackouts", being unconscious for ten to fifteen minutes in each. For three months he had had severe intermittent left frontal headaches, and for a month weakness and numbness of the right hand and forearm, with some recovery. For some months his memory had been poor and he was irritable. Three times during a severe headache he had noted a haze over his left eye for about ten minutes. A month before admission progressive right-sided hemiparesis developed, beginning in the face, and he became very lethargic.

Examination.—He was drowsy, and cooperation was limited. (There was no dysphasia as he was left-handed.) He had right spastic hemiparesis, right homonymous hemianopia, and bilateral papillœdema. Pulsation of the carotid arteries in the neck and in the fauces appeared to be normal. The blood-pressure was 135/90 mm. Hg. Radiographs of skull and chest were normal. The C.S.F. pressure was normal, and protein content 56 mg. per 100 ml. A left carotid angiogram on the day after admission showed complete occlusion of the internal carotid artery.

Course.—The patient became increasingly drowsy; evidence of severe brain-stem ischæmia appeared; and he died twenty-two hours after angiography.

Necropsy (Dr. A. F. J. Maloney and Dr. N. Maclean)

There was thrombosis of the whole of the left internal carotid artery, and the clot extended into the left anterior and middle cerebral branches for about 1·5 cm. The clot in the distal portion of the internal carotid artery was more recent than that situated proximally. No cause for the thrombosis was found.

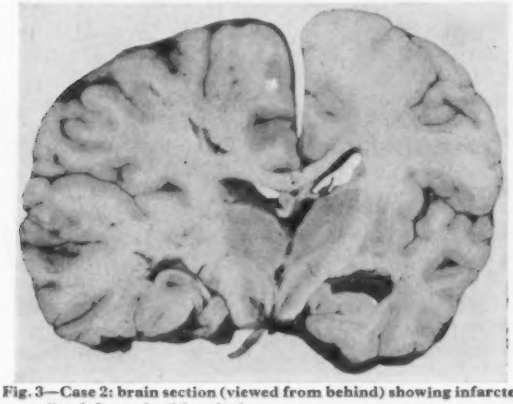

Fig. 3—Case 2: brain section (viewed from behind) showing infarcted swollen left cerebral hemisphere.

There was massive infarction of the left cerebral hemisphere in the territory of the middle cerebral artery; the age of the infarct varied in different parts from about two to twelve days. The hemisphere was very swollen and there were secondary brain-stem hæmorrhages (fig. 3).

Atheroma of the aorta and superior mesenteric artery, with old thrombosis of the latter vessel, were also found.

The earlier features were thought to be due to cerebrovascular accidents, but the later picture of a progressive enlarging intracranial lesion suggested the presence of a rapidly growing neoplasm. Progressive stenosis of the internal carotid artery would account for the initial symptoms, and there was complete obstruction of the lumen terminally.

Case 3.—A man, aged 72, was admitted to the National Hospital, Queen Square, on July 30, 1954, under the care of Dr. Michael Kremer (N.H. 53765). For two months he had noticed progressive difficulty in expressing his thoughts, and his wife found that he was becoming slow in his speech and did not always understand what was said to him. Two weeks before admission the right foot began to drag, and the whole limb rapidly became weak.

Examination.—He had mild motor and sensory dysphasia. The right leg was severely weak, but only slight clumsiness of the right arm could be detected. Reflexes were increased in the right limbs, and the plantar response was extensor. Sensation was normal. Blood-pressure was 210/100 mm. Hg, but the cardiovascular system was otherwise normal. Radiographs of skull and chest were normal. The C.S.F. was normal. The E.E.G. showed a slow-wave focus in the left frontal region, thought to be consistent with a neoplasm. A left carotid angiogram revealed obstruction of the internal carotid artery within a few millimetres of its origin; traces of dye in the ipsilateral carotid siphon suggested an anastomotic circulation. An air encephalogram showed cerebral atrophy, more advanced on the left side.

The picture here was of gradually progressive dysfunction of the left cerebral hemisphere, more suggestive of a neoplastic than of a vascular process, despite the patient's age and blood-pressure. Efficient anastomotic channels probably prevented severe ischæmia.

Case 4.—A housewife, aged 49, was admitted to the National Hospital, Queen Square, on Nov. 11, 1954, under the care of Mr. Wylie McKissock (N.H. 55679). For four months there had been obvious mental deterioration, which included memory impairment and personality changes. In the preceding few weeks she had had two seizures, in one of which there were involuntary movements of the right limbs. Progressive weakness of the right limbs and dysphasia then developed. When she was investigated elsewhere, the only abnormality was a C.S.F. protein of 200 mg. per 100 ml.

Examination.—There was severe dysphasia, bilateral papillœdema, right hemianopia, and severe right hemiplegia and hemianæsthesia with corresponding reflex changes. The cardiovascular system was normal. Radiographs of the skull were normal. The E.E.G. showed extensive slow-wave activity arising from the left temporal region. Ventriculography revealed a normal ventricular system. A left carotid angiogram showed complete occlusion of the internal carotid artery at the level of the cavernous sinus.

Course.—The patient has remained severely incapacitated by dysphasia and a right hemiplegia.

A provisional diagnosis of cerebral tumour seemed justifiable and ventriculography was carried out. A carotid angiogram, however, indicated the lesion.

Case 5.—A postmaster, aged 58, was admitted to the Royal Infirmary, Edinburgh, on Dec. 3, 1954. Fifteen months previously he had had a cardiac infarction, and since then

angina of effort. Four months before admission severe left-sided headaches began; they eased after two months. A right facial weakness of central origin appeared a month before admission, and two weeks later weakness and trembling of the right hand began. He also had episodes of severe, mainly expressive, dysphasia. On the morning of admission he had become increasingly drowsy, and had Cheyne-Stokes respiration.

Examination.—After intravenous infusion of hypertonic saline and sucrose solutions, he was not drowsy; but he had dysphasia (mainly expressive) and agraphia. He had moderately severe right hemiparesis and hemianalgesia and complete right homonymous hemianopia. The left pupil was dilated. The cardiovascular system was clinically normal, except for a blood-pressure of 195/115 mm. Hg. The C.S.F. was under normal pressure, and contained 21 cells (20 lymphocytes) per c.mm. and 220 mg. of protein per 100 ml. The E.E.G. was unsatisfactory owing to the patient's restlessness. Left carotid angiography showed partial occlusion of the internal carotid artery at the level of the cavernous sinus; some dye had entered the basilar and posterior cerebral arteries.

Course.—The patient became increasingly drowsy and died five days after admission (sixty hours after angiography) with evidence of brain-stem ischæmia. The lumbar C.S.F. examined thirty-six hours before death was under a pressure of 160 mm. water and contained 280 cells per c.mm. (mainly lymphocytes), and 142 mg. of protein per 100 ml.

Necropsy (Dr. A. F. J. Maloney)

There were extensive severe endarteritis and periarteritis of the internal carotid arteries and of most of their branches, and of the basilar artery. There was thrombosis of the termination of the left internal carotid artery, with occlusion of the anterior and middle cerebral branches.

There was a recent massive infarction of the brain in the distribution of the left anterior and middle cerebral arteries, and there were terminal secondary brain-stem hæmorrhages. In addition, generalised atheroma was seen, with severe involvement of the coronary arteries and aorta.

The progressive nature of the illness suggested an intracranial space-occupying lesion; but the episodic features, the previous history of a cardiac infarction, and the hypertension indicated the possibility of cerebrovascular disease. The internal carotid artery became completely obstructed only terminally. The nature of the endarteritis was not determined.

Discussion

The clinical spectrum of thrombosis of the internal carotid artery is wide, ranging from almost complete absence of symptoms, as in the patient of Willis (1664), who enjoyed " the free exercise of his mind and his animal functions ", to a rapidly fatal illness of apoplectic onset. Between these extremes are found most cases.

It is possible to delineate distinct clinical groups, and in the one discussed here there is a slowly progressive course simulating that of an intracranial space-occupying lesion.

In Johnson and Walker's (1951) series these cases formed the second group, whereas Behrman (1954), recognising four groups, placed them in his fourth. Törma and Troupp (1957) described acute, subacute, and chronic cases, and among the chronic cases were those masquerading as cerebral tumours. Paillas and Christophe (1955), using the same grouping, gave the name " pseudo-tumoral " to cases in which the course was slow and progressive. Whereas Smyth (1956) thought that they formed only a very small percentage of all cases, Johnson and Walker (1951) estimated the proportion at 25%. At the moment, however, there is insufficient information to indicate an incidence accurately.

Thrombosis of the internal carotid artery has not uncommonly been discovered by cerebral angiography carried out in the investigation of suspected intracranial tumour (Moniz et al. 1937, case 2; Riechert 1938, case 3; Sorgo 1939). There are many reports of individual cases and the patient of King (1951) is very similar to ours. Wood and Farmer (1957) have reported 5 cases of cerebral softening simulating brain tumour, in 3 of which obstruction of the internal carotid artery was the cause.

Pathology

The pathological processes responsible for the progressive downhill clinical course and the features of intracranial hypertension are on the whole easy to understand.

The first symptoms are produced by gradual encroachment on the lumen of the internal carotid artery, resulting in the syndrome of intermittent carotid insufficiency described by Denny-Brown (1951) and others. This explanation, which can also be applied to occlusive disease of other cerebral arteries (Corday et al. 1953) accounts for the clinical events better than " vasospasm " or multiple emboli, though these mechanisms cannot at the moment be excluded entirely. Initially the transient ischæmia does no permanent damage to the brain, but an area of infarction is eventually produced, and, as in our fatal cases (cases 1, 2, and 5), there is massive softening terminally owing to complete obstruction of the already constricted artery.

When infarction of brain tissue takes place, there is swelling of the affected part, and this can be seen in cases of softening due to occlusion of intracranial arteries (Sorgo 1939, Smiley 1952, Farmer and Swanton 1955, Scarcella 1956, Wood and Farmer 1957). When it results from obstruction of the internal carotid artery in the neck or at the base of the skull, the extent of the lesion is determined by the efficiency of the collateral channels and by the distribution of arteriosclerosis, which is usually the basic arterial disease. In cases 1, 2, and 5 (figs. 1 and 3) there was severe swelling of the affected cerebral hemisphere; the cases of Raney (1948), King (1951), Paillas and Christophe (1955), and Berry and Alpers (1957) were similar. Death is due to ischæmia and hæmorrhagic destruction of the brain-stem (fig. 2) exactly comparable to that with a supratentorial cerebral neoplasm, and due to displacement of intracranial structures by an expanding mass of infarcted brain tissue (fig. 2). Thus the picture—of intermittent focal brain ischæmia, followed later by infarction, and, after complete carotid obstruction, by extension of the cerebral lesion, which behaves in all respects like a growing tumour—may be indistinguishable from that of a space-consuming lesion.

Clinical Findings

There are often two stages in the development of the picture: firstly the progressive or intermittent appearance of focal symptoms, and secondly the features of a space-occupying cerebral lesion, which usually necessitate admission to hospital. The usual history is one lasting weeks or even years, characterised firstly by persistent headache, which is also a common feature in other types of carotid thrombosis; but as in case 4 headache may be absent. Focal or generalised convulsions, and progressive weakness and paræsthesiæ of the limbs on one side, mainly in the arm, now appear, often in this order, and if the dominant hemisphere is involved dysphasia will be added. The defects of speech and limbs may appear in attacks with complete recovery between them; and these episodes, which presumably result from transient cerebral ischæmia, may closely simulate focal epileptic

attacks. Eventually permanent signs appear. There is also impairment of mental state, and this too may be progressive or intermittent and may be related to disturbance of language function when the dominant hemisphere is involved.

On examination in the second clinical phase, all the signs of a cerebral tumour may be discovered. The patient may be drowsy and papillœdema is often present. As in cases 1, 2, and 4, the papillœdema may be bilateral and at times greater on the side of the affected cerebral hemisphere (case 1); as much as 3 dioptres have been observed (Riechert 1938, case 3; Poppen and Baird 1952). Unilateral swelling of the disc, on the involved side, has been described, but in some of these cases the swelling has been an early sign of occlusion of the central retinal artery (Feiring 1954, Lamont and Brink 1956). In view of the occasional appearance of ipsilateral optic atrophy with carotid-artery thrombosis the Foster-Kennedy syndrome would be possible, but it has not been described (Fisher 1952). The signs elsewhere in the central nervous system indicate extensive cerebral damage. Clearly such cases as these may closely mimic an intracranial expanding lesion, and further investigation may emphasise the similarity.

Investigations

Skull radiography.—If an infarcted area of brain is large enough a pineal shift may be seen (King 1951, Jefferson 1955, Drori et al. 1957), but this is rare. Jefferson (1955) has pointed out that radiological evidence of sellar erosion, identical with that produced by intracranial hypertension due to a tumour, can arise in patients with raised blood-pressure. As internal carotid thrombosis often occurs in the presence of hypertension a further similarity is possible.

Cerebrospinal fluid.—Its pressure may be raised (Sastrasin 1957, case 1), but little is known of the lumbar fluid as lumbar punctures are rarely carried out in the presence of papillœdema. As in our cases, the protein content and cell count of the lumbar and the ventricular C.S.F. are often increased, because of the large area of destroyed brain tissue.

Electroencephalography.—Abnormalities are commoner than with other types of cerebrovascular disease (Feiring 1954), and, as in our cases, there is often a focus of abnormal electrical activity which may be mistaken for that produced by a cerebral tumour or abscess; but differentiation is usually possible if serial recordings are made. Paillas and Christophe (1955) have discussed the E.E.G. changes in detail.

Air studies may indicate the presence of an intracranial mass (Elvidge and Werner 1951, Törma and Troupp 1957, case 1), but more often they are normal or show a dilated ventricle on the side of the diseased artery with a ventricular shift toward that side, indicating cerebral atrophy resulting from chronic ischæmia of the hemisphere (Johnson and Walker 1951).

Types of Space-occupying Lesion

In differential diagnosis three types of intracranial space-taking lesion must be considered: cerebral neoplasm, cerebral abscess, and traumatic intracranial hæmorrhage.

The confusion between internal carotid artery thrombosis and primary cerebral neoplasm during the early days of carotid angiography has already been mentioned and in addition Paillas and Christophe (1955) point out the possibility of the arterial lesion mimicking a secondary brain tumour. Most authors have mentioned this diagnostic difficulty, and our cases 2–5 are examples of it.

The findings most commonly simulate a malignant glioma.

Carotid thrombosis may complicate an injury to the neck or head. With the latter, all the manifestations of cerebral compression can be produced, and extradural, subdural, or intracerebral hæmorrhage is invariably diagnosed (Sedzimir 1955). Non-penetrating trauma of the carotid vessels may also result in drowsiness and hemiplegia, which always follow a " lucid interval ". As there is often an associated head injury, or even if there is not, a diagnosis of extradural hæmatoma is not unnaturally made, whereas the responsible lesion may be thrombosis of the internal carotid artery (Schneider and Lemmen 1952, Murray 1957). Similar events may result from penetrating carotid injury (Caldwell and Hadden 1948), and case 5 of Raney (1948) offers a good example of how infarction of brain tissue due to acute internal carotid obstruction may have all the characteristics of an intracerebral expanding mass.

Diagnosis

If treatment is to be effective internal carotid artery thrombosis must be diagnosed as early as possible, and certainly before complete arterial occlusion, which may produce irreversible cerebral destruction and often death. Differentiation of the spontaneous type of carotid thrombosis from a cerebral neoplasm or abscess may be difficult and the two can be indistinguishable even in the presence of vascular disease elsewhere (cases 3 and 5). Palpation of the artery in the neck or tonsillar fossa is generally agreed to be of little value, and the only infallible test is carotid angiography. But this is not without its risks, especially in these patients, and some have died (King 1951, Wilson 1955); the angiogram may have contributed to the deaths in our cases 2 and 5. Furthermore, Diethelm and Dontenwill (1953) have reported carotid thrombosis following angiography. It is, however, possible that a less irritating radioopaque material, such as 'Thorotrast', would be justified in these cases. It seems that a more innocuous investigation should be tried first. Milletti (1950), Heyman et al. (1957), and others recommend the estimation of retinal-artery pressures, and Fisher (1957) has reported that a bruit heard over the healthy carotid artery is of diagnostic value. It has often been observed that compression of the uninvolved internal carotid artery may produce syncope (Paillas and Bonnal 1952, Shapiro 1952, case 3), and Paillas and Christophe (1955) recommend that an E.E.G. should be made at the same time; but personal experience (P. H.) indicates that the test is not invariably reliable. Symptoms on the unaffected side of the body may also follow compression of the healthy artery, and Parkinson (1957) has indicated the value of this test in the differentiation of carotid thrombosis from cerebral tumour. An application of the technique of Meyer et al. (1956), who found E.E.G. changes in the presence of insufficiency of carotid blood-flow and a fall of blood-pressure, may also be useful. Direct inspection of the vessel may, however, be necessary, and at times angiography cannot be avoided.

A further diagnostic possibility of the greatest importance is occlusion of the internal carotid artery in the presence of an intracranial space-occupying lesion. Thus Pauly (1954) describes a patient with the clinical appearances of a cerebral neoplasm who was shown by angio-

graphy to have complete occlusion of the ipsilateral internal carotid artery in the neck. The angiogram was repeated and the vessel was now patent, indicating presumably that the initial findings were due to arterial spasm; this patient had a frontoparietal glioma. Similar cases are reported by Erikson (1943) and Krayenbühl and Weber (1944, case 19), and Gros (1955) mentions spasm of the internal carotid artery associated with a cerebral abscess. Thus the angiographic demonstration of an obstructed artery in a patient with symptoms and signs of a cerebral tumour does not necessarily invalidate the diagnosis of a neoplastic or infective process in the brain. The appearances of the angiographic block often permit differentiation, but further angiography (preferably by direct exposure of the artery) or air studies will be necessary in these difficult cases.

Another possibility is slowly progressive internal carotid thrombosis as a complication of malignant hypertension, for symptoms and signs of high intracranial pressure together with focal neurological abnormalities would be expected. Clarke and Murphy (1956) did not find an example among 190 patients with hypertension and papilloedema, but not all the necropsies included inspection of the carotid arteries in the neck.

Treatment

The mortality and morbidity of internal carotid artery thrombosis are high. Sastrasin (1957) estimates the mortality at 34%; of the survivors of his 65 patients, more than half had a severe neurological deficit. Our approach to treatment must therefore be as active and as early as possible. Nevertheless, the prognosis in many cases is determined not by the lesion of the internal carotid artery alone but also by the basic defects of arteriosclerosis and inadequate collateral channels.

If possible, treatment should be carried out before complete arterial occlusion takes place, but this is only occasionally feasible; Edwards and Rob (1956) report the successful surgical handling of a stenosed artery. Medical measures, such as antispasmodic and anticoagulant drugs, have not been very effective in the chronic or the acute phases of the disease, and anticoagulants are thought by some to be contraindicated in view of possible hæmorrhagic complications in the brain. A surgical approach seems to be more profitable (Rob and Wheeler 1957), and Strully et al. (1953) have described a patient who was at first thought to have a cerebral neoplasm but who was shown by angiography to have thrombotic occlusion of the internal carotid artery, and in whom thromboendarterectomy was successful.

In the acute phase of complete arterial occlusion, therapy has unfortunately been unavailing. To counter the swelling of the brain produced by infarction, bilateral subtemporal decompression has been carried out without success (Schneider and Lemmen 1952, case 2), and other measures to reduce intracranial tension have also failed to prevent death. Hypothermia, as used with other cerebrovascular conditions (Lougheed et al. 1955, Burrows et al. 1956, Bohm et al. 1957), may be more valuable, and together with the advance of arterial surgery may some day reduce the mortality and morbidity of this disease.

The importance of considering thrombosis of the internal carotid artery when dealing with a patient manifesting the features of an intracranial space-occupying lesion is obvious, and the earlier the diagnosis can be made the more effective is treatment likely to be.

Summary

Among the many clinical pictures produced by occlusion of the internal carotid artery is that of an intracranial space-occupying lesion.

5 illustrative cases are reported; in 4 cerebral neoplasm had been diagnosed, and in 1 cerebral abscess.

The early symptoms are due to carotid-artery insufficiency, and the syndrome of intracranial hypertension is produced by the area of brain softening and surrounding œdema which appear eventually.

Symptoms and signs, as well as radiographic, C.S.F., and E.E.G. abnormalities, may be identical with those due to a space-occupying lesion; and certain differentiation can be made only by carotid angiography.

An incorrect diagnosis of cerebral neoplasm, cerebral abscess, or traumatic intracranial hæmorrhage may be made in the presence of carotid-artery occlusion.

Treatment, to be effective, must be early; operation on the artery seems to be the only hopeful possibility.

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EFFECT OF CERTAIN DIETARY OILS ON BILE-ACID SECRETION AND SERUM-CHOLESTEROL

BARRY LEWIS
M.B., Ph.D. Cape Town, A.R.I.C.
With the technical assistance of ENID VOLKS, B.Sc. Cape Town
From the Clinical Nutrition Unit of the Council for Scientific and Industrial Research and the Department of Medicine, University of Cape Town

THE serum-cholesterol level is raised by most fats of animal origin, but is lowered by many highly unsaturated oils from vegetable and marine animal sources (Frishley et al. 1955, Ahrens et al. 1955, Bronte-Stewart et al. 1956). The object of the present study was to identify the mechanism or mechanisms by which these unsaturated oils lower the serum-cholesterol. Gordon et al. (1957a, 1957b) showed that the feeding of sunflower-seed oil increased the excretion of bile acids in the fæces—to an extent that would fully account for the cholesterol leaving the circulation. Hellman et al. (1957), using ^{14}C-labelled cholesterol, have shown increased fæcal elimination of the radioactive material on feeding corn oil. There is little doubt (Siperstein et al. 1952, Bergström and Norman 1953, Siperstein and Chaikoff 1955, Siperstein and Murray 1955) that cholesterol is excreted mainly as bile acid, both in the rat (taurocholic acid), and man (glycocholic acid). In the experiments to be described, three patients with complete bile fistulæ were studied, the bile-acid output being followed during manipulation of the serum-cholesterol by administration of various fats and oils.

Methods

The clinical features are summarised in table I. No patient had clinical or biochemical evidence of disturbed liver function; nor was there overt infection of the biliary tract.

On and after the third postoperative day, they received a basal diet yielding 2000 calories and containing 75 g. protein and 5 g. fat. The common bile duct was drained through a T-tube; this was indicated after exploration of the duct, and in case 2 the dilated sphincter of Oddi was splinted by a long-limbed T-tube. Wangensteen drainage was used in cases 1 and 2 but was probably unnecessary, for collection by siphonage in case 3 was entirely adequate. The postoperative course of the patients was satisfactory, and no deleterious effects resulted from this regime. The fistulæ were thought to be virtually complete, because little or no bile acid was detected in the fæces, and the stools were pale. Blood was drawn at intervals of about 48 hours, at 9 A.M. Fat absorption, as expected, was impaired by the existence of bile fistulæ; absorption was 80–90% during fat feeding. In animals with bile fistulæ, 65–75% of fat is absorbed (Pessoa et al. 1953).

Bile was collected in 24-hour batches, with thymol as a preservative; it was stored at −15°C and worked on within 4 days. Aliquots of 1 ml. were saponified in sealed ampoules at 120°C for 4 hours, by means of 2 ml. of 2 *N* sodium hydroxide. The unsaponifiable fraction was extracted with petroleum ether (40–60°C boiling-point) and the cholesterol content determined by the Liebermann-Burchard reaction. The aqueous phase was then acidified; congo red was used as the indicator. Fatty acids were removed by petroleum ether extraction, and bile acids extracted with four 4-volume quantities of ether; the ether extract was washed with 0·2 volumes of water, then taken to dryness. In this form it was stored at −15°C until analysis was completed. Bile acids were identified and determined by Mirvish's (1958) quantitative modification of the reversed-phase column-chromatographic procedure of Sjövall (1953). In this laboratory the overall procedure has given 85–97·5% recoveries of cholic acid and 82–100·2% recoveries of deoxycholic acid. The chromatographic system does not resolve deoxycholic from chenodeoxycholic acid.

Serum-cholesterol was determined by the method of Abell et al. (1952) as modified by Anderson and Keys (1956). The procedure of van de Kamer et al. (1949) was used in measurements of fæcal fat.

Sunflower-seed oil, of refined grade, was used from a single batch; the iodine value was 135, and the Liebermann-Burchard chromogen in the unsaponifiable fraction was equivalent to 751 mg. cholesterol per 100 ml. Coconut oil was hydrogenated

CLINICAL FEATURES OF THE THREE PATIENTS

Case	Age	Sex	Race	Operation	Interval between operation and first basal observation
1	30	F	African	Cholecystectomy and choledochotomy for stone in common duct	5 days
2	36	M	European	Sphincterotomy for relapsing pancreatitis	8 days
3	68	M	Coloured	Cholecystectomy and choledochotomy for stone in common duct	5 days

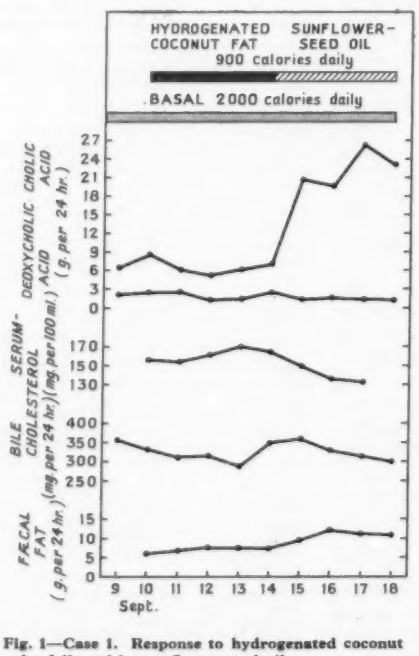

Fig. 1—Case 1. Response to hydrogenated coconut fat followed by sunflower-seed oil.

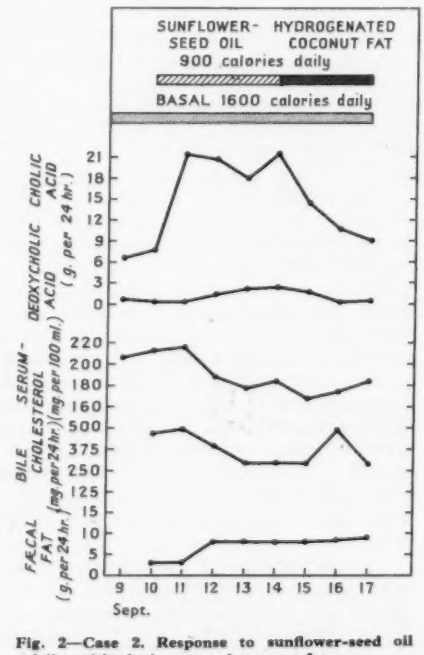

Fig. 2—Case 2. Response to sunflower-seed oil followed by hydrogenated coconut fat.

to an iodine value of 6, and contained 303 mg. per 100 ml. of similarly measured sterol. The oils were administered uncooked, in divided doses. A preparation of cotton-seed oil for intravenous use ('Lipomul', Upjohn), emulsified with 'Pluronic F68' and soybean phosphatide, was also used. This oil had an iodine value of 115. On intravenous administration the emulsion lowers the serum-cholesterol (H. Gordon, unpublished observations)—a property not shared by a comparable oil-free solution containing the emulsifying agent. Unfortunately no similar preparation of a saturated fat was available.

Results

CASE 1.—Hydrogenated coconut oil did not raise the serum-cholesterol level, and had no effect on the composition of the bile. Sunflower-seed oil given for 4 days lowered the serum-cholesterol significantly and produced a fourfold increase in the cholic-acid secretion. Deoxycholic-acid and bile-cholesterol output did not vary consistently. The fæces were virtually bile-free. The increase in cholic-acid secretion began on the day the oil was introduced, and thus preceded the fall in serum-cholesterol (fig. 1).

CASE 2.—The order in which the oils were administered was reversed in this experiment; the response was essentially similar (fig. 2), except for a moderate rise in the deoxycholic-acid (+ chenodeoxycholic-acid) peak. When sunflower-seed

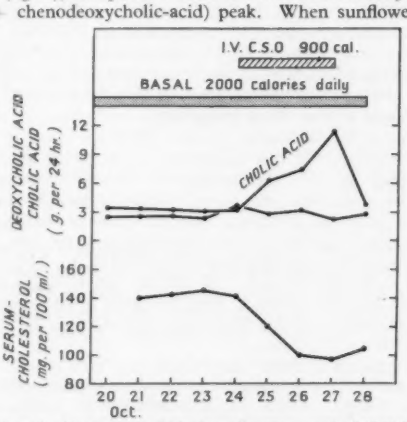

Fig. 3—Case 3. Response to infusion of cotton-seed oil (I.V.C.S.O.)

oil was replaced by hydrogenated coconut oil, the cholic-acid secretion fell steeply but did not reach the basal level in 3 days.

CASE 3.—Intravenous infusion of cotton-seed oil was at least as effective as oral sunflower-seed oil in lowering the serum-cholesterol; cholic-acid output was increased (fig. 3).

Discussion

This investigation was based entirely on transient-state observations, being concerned with the phenomena associated with a *changing* serum-cholesterol. The establishment of bile fistulæ increases bile-acid synthesis in rats (Eriksson 1957), a plateau being reached in 3–4 days. The present experiments were internally controlled, and the basal observations began not less than 5 days after operation. Diet-induced fluctuations in the serum-cholesterol could theoretically be due to variations in its rate of synthesis, absorption, deposition, excretion, or catabolism, in the process of cholesterol "trapping" (Byers and Friedman 1955), or in more than one such mechanism. An earlier communication (Gordon et al. 1956) described our failure to demonstrate significant changes in fæcal Liebermann-Burchard-reacting sterols during manipulation of the serum-cholesterol by dietary means, and our demonstration of increased fæcal bile-acid excretion during feeding of sunflower seed oil. Fluctuations in fæcal sterol excretion, in fact, correlated best in that study with the dry weight of fæces, and were conditioned by the dietary phytosterol content.

Ingestion of unsaturated oils does not suppress cholesterol absorption (Karvinen et al. 1954). Nor does it reduce cholesterol synthesis; evidence from in-vitro studies using labelled substrates is to the contrary (Merrill 1958). In the light of the present experiments as well as by exclusion, the hypothesis is submitted that certain vegetable oils (administered orally or intravenously) reduce the serum-cholesterol by a mechanism which involves accelerated catabolism of cholesterol to cholic acid. Siperstein et al. (1952) and Siperstein and Murray (1955) were able to recover 95% of the radioactivity of labelled cholesterol from the fæces, of which over 80% was in the bile-acid fraction, the remainder in neutral material.

Conversely, the elevation of serum-cholesterol levels by hydrogenated coconut fat was not associated with reduction of bile-acid output, measured directly in two people with fistulæ or indirectly in the fæces of six normal ones (Gordon et al. 1957a, 1957b), though Salomon (1926) described a rise in bile-cholesterol on feeding butter. This is somewhat at variance with the results of Hellman et al. (1957) in a patient with hypercholesterolæmia. Using cholesterol-4-^{14}C, they found that butter oil increased the serum-cholesterol and reduced the fæcal excretion of "cholesterol and its end products"; corn oil had the reverse effects. These workers inferred an intestinal excretory mechanism for the regulation of the serum-cholesterol. Kinsell et al. (1958) were unable to detect reciprocal changes in the serum-cholesterol and the fæcal-sterol excretion on feeding a variety of preparations containing unsaturated fatty acids. The findings in the present study favour a catabolic mechanism for the action of some oils in lowering the serum-cholesterol, but point to an unrelated mode of action for hydrogenated coconut oil in elevating the level of this sterol. It is widely held that saturated fats increase the synthesis of cholesterol from acetyl coenzyme A, which arises from β-oxidation of fatty acids. Fasting depresses cholesterol synthesis (van Bruggen et al. 1952), and feeding of fat increases the rate of incorporation of ^{14}C-labelled acetate into cholesterol, simultaneously decreasing its conversion to glycogen and fatty acid (Whitney and Roberts 1955).

Quantitative considerations indicate that far more bile acid is produced during oil feeding than is necessary to account for the disappearance of cholesterol from the circulation. The inference is either that cholesterol is being mobilised from the tissues, or (more probably) that cholesterol synthesis is increased during administration of oil. Increased synthesis from acetate has been demonstrated in liver slices from animals previously fed on cotton-seed oil (Whitney and Roberts 1955). An analogy may be drawn with hyperthyroidism, where there is a tendency to a low serum-cholesterol despite increased cholesterol synthesis (Kurland and Lucas 1955). Weiss and Marx (1955) have shown in animal experiments that thyroid hormone stimulates the degradation of cholesterol to acid derivatives.

Summary

Bile-acid excretion has been studied during the administration of various types of fat, to three patients with complete bile fistulæ.

Sunflower-seed oil (by mouth) and cotton-seed oil (intravenously), which are both highly unsaturated, produced a remarkable increase in the rate of cholic-

acid secretion, which preceded the fall in serum-cholesterol. On the other hand, a saturated fat (hydrogenated coconut oil), did not affect the bile-acid output but raised the serum-cholesterol. These findings support the hypothesis that the mechanism by which the serum-cholesterol is reduced by certain vegetable oils involves accelerated catabolism of cholesterol to cholic acid.

Sincere thanks are due to Dr. S. Mirvish for allowing access to his analytical method before its publication, to Prof. J. F. Brock and Prof. L. Eales for helpful criticism and encouragement, and to Prof. J. Louw, Mr. D. J. du Plessis, and Mr. G. Sacks for making patients available for these studies. Messrs. Merck & Co. provided samples of bile acids.

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HYPOTHERMIA BY INTERNAL COOLING IN MAN

H. H. KHALIL
M.B. Alexandria, Ph.D. Lond.
LECTURER IN MEDICINE, UNIVERSITY OF ALEXANDRIA, EGYPT

IN 1954 a new method of lowering or raising body temperature in animals and man by introducing cold or warm water inside an intragastric bag was described (Khalil and Mac Keith 1954). In September, 1956, at the second European Congress of Cardiology, a series of experiments was reported where deep hypothermia in dogs was induced by a continuous flow of cold water through an intragastric water balloon, and the term "internal cooling" was suggested for this new and simple method.

In the two cases at Alexandria University Hospital reported here, this method was used in neurosurgery in man. The apparatus used was the same as that which I have been using for dogs, modified to make it more compact, easier to manage, and generally more suitable for a hospital operating-theatre.

Apparatus

The apparatus (fig. 1) consists of a water tank N, of 10 litres capacity, which can be either cooled by means of a cooling coil D attached to a compressor, or warmed by means of an electric resistance coil P. Both coils are immersed in the water inside the tank. The temperature of the water is controlled by means of two thermostats—R for cooling and R_1 for warming. The water tank is surrounded by a thick cork jacket which provides temperature insulation.

A suction water-pump F sucks the water from the intragastric balloon into the water tank N, and, since the tank is hermetically sealed, automatically drives an exactly equal volume of water to the balloon. In this way, the volume of the balloon remains constant. Two air-traps G and K are included in the circuit—one G just before the suction-pump and the other K between the tank and the balloon—to prevent air from entering the balloon or the pump.

A graduated 5-litre jar H, with an attached sphygmomanometer pump and a bottom tap T, lies above the tank. It is connected to the tank by a T-piece. Tap T is opened only while filling or emptying the balloon. A (Palmer) flow-meter C is also included in the circuit, between the balloon and the pump. The screw-clamps S and S_1 are applied to the thick rubber tubing leading to and from the balloon. They are used to clamp the rubber tubing while the empty balloon is being introduced into the stomach, to prevent water from leaking into it at that time. A special metal junction M is designed to allow to-and-fro currents through the tubes A and B leading to and from the intragastric balloon, the tubes being made of 'Porges Neoplex', 1·0 metre long. The outer tube should be 1·0 cm. in diameter and the inner one 0·6 cm. The intragastric balloon itself is an ordinary condom—preferably two, one inside the other, in case one should accidentally leak. A thermometer is immersed into the air-trap K to register the temperature of the inflowing water. The whole apparatus is fitted inside a suitable stand with wheels to allow rapid transport.

Operation of the Machine

The tank and all the tubing and air-traps are filled with water from jar H. The intragastric water balloon is then tested by distension with water, which is done by applying pressure in the jar H through the sphygmomanometer pump. The balloon is then emptied by switching on the suction water-pump and clamping the rubber tube at S_1. The suction-tube is then also clamped at S, and the tap T closed and the pressure in jar H released. After insertion of an intratracheal tube, the balloon is introduced into the stomach through the mouth. It goes with ease.

When the intragastric balloon is in situ, both clamps (S and S_1) and tap (T) are opened and pressure applied in jar H to fill the balloon to the required volume as shown by the graduations on the jar. When the balloon is full, the stomach should be palpated through the anterior abdominal wall to see that it is not unduly tense. Tap T is then closed and the pump switched on. Any air still remaining in the circuit will immediately be trapped in jars G and K as the water circulates. The thermostat of the water-cooler unit is adjusted to the range between 5° and 7°C and the rheostat of the pump so adjusted that about 10 gallons (45·5 litres) of water passes per hour, as indicated by the flow-meter. In this way 0·75 litre of cold or warm water will circulate through the balloon per minute. The intragastric balloon should never be filled with more than 1·5 litres of water. The arrangement by which the balloon receives only a volume of fresh water equal to what has been withdrawn will keep the volume of the balloon constant throughout the cooling or rewarming procedures, without any risk of overdistending the stomach.

If the rate of cooling the body is more rapid than is desired, the volume of the balloon is reduced by clamping the rubber tube at S and opening tap T; the water will then be diverted to the jar instead of returning to the balloon. When the required volume is reached, tap T is closed and clamp S_1 is released. The same procedure should be repeated whenever the volume of the bag should be changed as judged by the rate of cooling or rewarming the body.

When rewarming is indicated, the warming unit with its thermostat is switched on instead of the water cooler. The circulating water will then be gradually warmed according to the adjustable thermostat; but its temperature should not rise more than 10°C above the rectal temperature, and should never exceed 40°C.

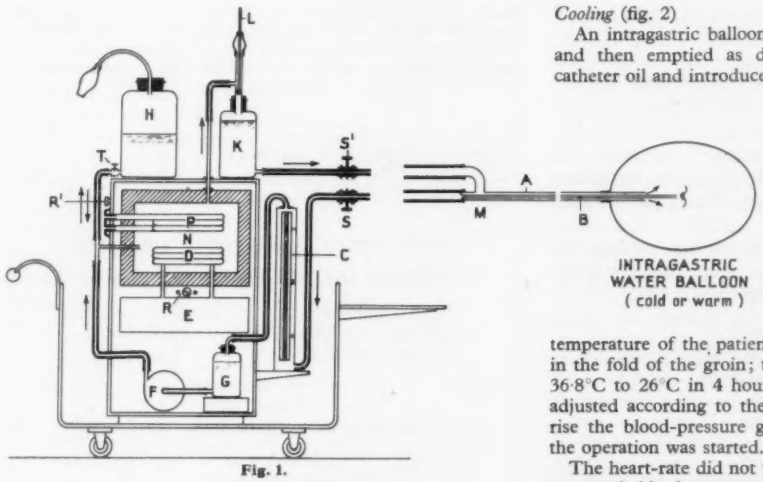

Fig. 1.

Case-reports

Case 1.—An adult was admitted to the neurosurgical unit, Alexandria University Hospital, with a large swelling on the vault of the skull and signs of bilateral pyramidal-tract involvement. The symptoms had started three years previously and had been progressive. Arteriography revealed a large parasagittal meningioma of the size of an orange.

The operation was performed by Dr. B. Vlahovitch and Dr. S. Boctor. Anæsthesia was conducted by Dr. H. Nassar and Dr. W. Narshy.

Premedication

The patient was prepared with chlorpromazine 25 mg. and promethazine 50 mg. at 2 A.M.; this was repeated at 6 A.M. 1 mg. atropine was given at 8 A.M. Anæsthesia was induced with sodium thiopentone. An endotracheal tube was introduced and its cuff inflated. Anæsthesia was maintained by nitrous oxide and oxygen.

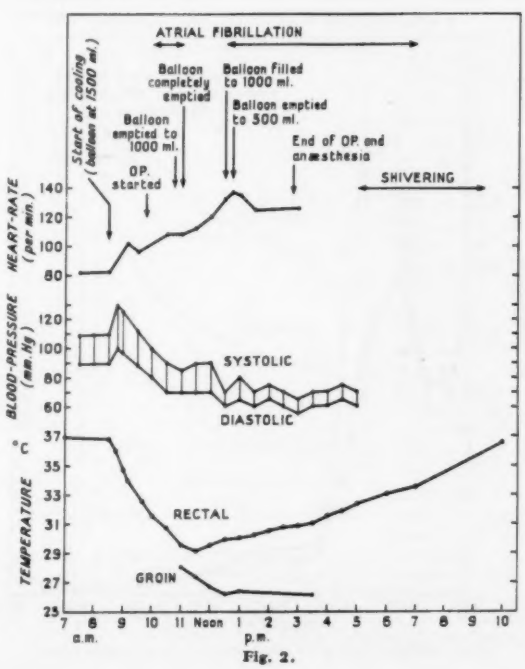

Fig. 2.

Cooling (fig. 2)

An intragastric balloon, which had been tested beforehand and then emptied as described above, was smeared with catheter oil and introduced with ease into the stomach. About 1·5 litres of water was pumped into the balloon from jar H, which was then isolated by closing tap T. The stomach could be felt easily through the abdominal wall and was not unduly tense. The patient was then put in the semi-sitting position for the operation. Cooling was started at 8.30 A.M. by switching on the pump and the cooling compressor. The temperature of the circulating water dropped to 5°C in 10 minutes. The temperature of the patient was recorded both by rectum and in the fold of the groin; the groin temperature dropped from 36·8°C to 26°C in 4 hours (fig. 2). The rate of cooling was adjusted according to the surgeon's request. After an initial rise the blood-pressure gradually declined, beginning before the operation was started.

The heart-rate did not undergo a corresponding drop. This was probably because of the chlorpromazine and atropine premedication, in addition to the rather large blood-loss during the removal of the angiomatous tumour. Atrial fibrillation began at 10 A.M., when the rectal temperature was 31·5°C, and disappeared when cooling was stopped and the bag emptied at 11 A.M. It recurred at 12.30 P.M. and remained till 7 P.M., the rectal temperature then being 33·5°C. This may have been another cause for the tachycardia.

Operation

The operation was started when the rectal temperature was 32·2°C, 75 minutes after the start of hypothermia; it took 5 hours, ending at 2.45 P.M. During the latter half of the operation, cooling was started again by filling the balloon with 1·0 litre of circulating water for 10 minutes, and then maintained at a slower rate by keeping only 0·5 litre circulating. This was done on the surgeon's request to retard spontaneous rewarming. Otherwise, rewarming was left to take place spontaneously. Anæsthesia was stopped as soon as the operation was completed. The patient became responsive soon afterwards, and began to talk within an hour of the end of the operation. During the rewarming period mild shivering began when the rectal temperature reached 32°C and continued until it reached 36°C.

Postoperative Course

This was uneventful. Next morning there was no epigastric tenderness, even on deep palpation and pressure. The patient asked for food at lunch-time but was given fluids only, including milk. There was no vomiting. Solid food was started on the third day.

From the clinical point of view the result was very satisfactory. The patient regained considerable motor power in his affected limbs within the next few days.

Case 2.—A man, aged 42, was admitted to hospital with severe frontal headache, mental changes, and blurring of vision. On examination there was primary optic atrophy on the left side and severe papillœdema on the right side (Foster Kennedy's syndrome). Arteriography showed distinct shift of the left anterior cerebral artery to the right, suggesting a tumour of the left frontal lobe.

Operation

This was carried out after induction of hypothermia to 32°C, by the same technique as in case 1. There was no arrhythmia, and the heart-rate dropped from 110 to 70. A left fronto-temporal flap was turned. The lateral ventricle was tapped to diminish the increased tension. Localised frontal lobectomy was carried out exposing a dark reddish tumour that extended posteriorly under the anterior horn of the left lateral ventricle and around the left optic nerve and tract reaching the hypothalamic area. The major part of the tumour was removed,

leaving only the deep infiltrating part in relation of the internal capsule.

Postoperative Course

The patient did well, and 5 days after the operation he was on full diet. Clinically the result was satisfactory.

Discussion

The advantages of internal cooling, compared with surface cooling or extracorporeal blood cooling, have been discussed elsewhere (Khalil and Mac Keith 1954, Khalil 1957a, b).

An apparatus for application of internal cooling has been described (Barnard 1956), but the apparatus described here has several advantages:

Instead of pumping water into the stomach, the pump sucks the water from the balloon to the tank, the same volume of fresh cold water automatically passing from the water tank to the balloon. It is impossible to overfill the stomach.

The volume of the balloon can be adjusted at any moment to the required volume with greater ease.

A flow-meter is included in the circuit. By this means the rate of flow of water through the balloon can be controlled. This is particularly useful in the shift from cold to warm water, when the rate of flow should at first be slow in order not to damage the gastric mucosa.

Air-traps are included in the apparatus. This is considered essential for the smooth performance of the pump and to prevent air from getting to the balloon.

The action of the apparatus can be changed from cooling to rewarming at any moment. Accordingly:

(*a*) If, during the induction, serious cardiac arrhythmias appear, change to rewarming is possible.

(*b*) After the operation is completed, the patient can be rewarmed to 35–36°C; the blood-pressure will then rise, and any bleeding-points can be noted and ligated before the field of operation is closed.

(*c*) In cardiac operations the surgeon can perform the critical part of operation after rewarming has been begun by internal warming. The myocardium will then be colder than the blood supplying it, and will presumably get the oxygen it demands more easily than during the cooling period (Barcroft and King 1910). The heart-muscle will then probably be less irritable to touch and other surgical insults than it is where the heart is hypothermic from other techniques. Work is in progress in dogs to test the advantage of this procedure.

Hypothermia by internal cooling presents advantages, and it is hoped that the simplicity and safety of this method will lead to its being tried in other indications for hypothermia. Construction of the machine described here should be within the capacity of any good firm of engineers.

Summary

An apparatus for giving a continuous flow of cold or warm water through an intragastric balloon is described.

Two cases in which intracranial tumours were removed surgically under hypothermia by internal cooling are reported. The first patient was cooled to a rectal temperature of 29°C and the second to 32°C.

The method proved simple, easy to manage, and very effective—so much so that it was necessary to keep the intragastric balloon only half-filled to avoid too rapid cooling. Both patients had an uneventful postoperative course.

This method could be used in major neurosurgical and cardiac operations and in other indications for hypothermia.

I thank Prof. M. L. Dowidar, head of the department of surgery, Dr. B. Vlahovitch, and Dr. S. Boctor for permission and facilities to conduct this work in the department of surgery, Alexandria University; Dr. H. Nassar and Dr. W. Narshy for their help and cooperation and for conducting the anæsthesia; Prof. M. Naim for his encouragement and guidance; Mr. S. Mikhail for his valuable technical assistance; and Dr. R. C. Mac Keith for correcting the draft of the paper and for his help in many other ways.

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INFLUENCE OF LIGHT ON THE HYPERBILIRUBINÆMIA OF INFANTS

R. J. CREMER*
M.B. Lond., D.C.H.
PÆDIATRIC REGISTRAR

P. W. PERRYMAN
M.Sc. Lond.
BIOCHEMIST

D. H. RICHARDS
F.I.M.L.T.
CHIEF TECHNICIAN, BIOCHEMISTRY DEPARTMENT

GENERAL HOSPITAL, ROCHFORD, ESSEX

IN the first two weeks of life a raised serum-bilirubin level from any cause may lead to kernicterus. In those who have died, necropsy has shown staining by bilirubin of certain cells in the central nervous system, principally in the basal ganglia. The mechanism of this change is unknown, but there is evidence that it may be caused by an inhibitory action of excessive bilirubin on essential cellular respiratory activity.

Day (1954) showed that oxygen uptake of rat brain is significantly reduced in the presence of bilirubin 20 mg. per 100 ml., but that no such inhibition is found with biliverdin. Zetterström and Ernster (1956), working with liver mitochondria, showed that bilirubin at a concentration of 20 mg. or more per 100 ml. exerts a powerful uncoupling effect on oxidative phosphorylation. Lathe and Walker (1957) show that the livers of the newborn cannot conjugate bilirubin, which is unexcretable, to the glucuronides of bilirubin, which are excretable—the necessary enzymes being absent or deficient.

* Present address: Hillingdon Hospital, Middlesex.

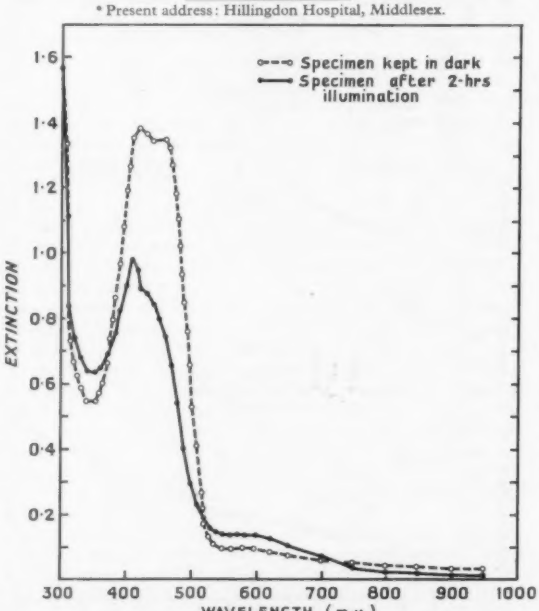

Fig. 1—Effect of light on absorption curve of icteric serum.

Mollison and Cutbush (1951) showed that the incidence of signs of kernicterus increases as the concentration of serum-bilirubin rises above 20 mg. per 100 ml., and that below this figure ill effects are rare. The prevention of a high level of serum-bilirubin, or the destruction of this substance, or its removal from the blood-stream, will prevent kernicterus. This has hitherto been achieved by replacement transfusion. Where experienced staff and good laboratory facilities exist, results are highly satisfactory (Norman 1957). However, such facilities are not universal, and an alternative approach seems desirable.

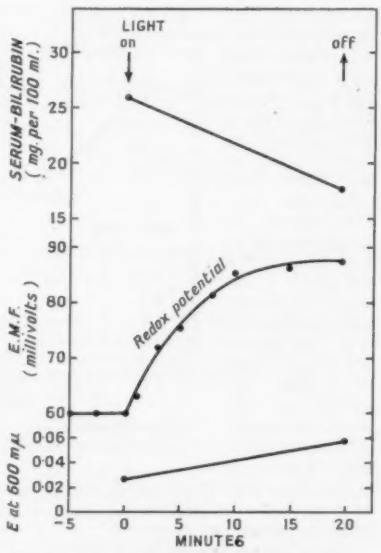

Fig. 2—Effect of light on icteric serum.

Effect of Light on Serum-bilirubin

During serial estimations of the serum-bilirubin in jaundiced infants we noticed that their serum-bilirubin is highly photosensitive in vitro (Cremer, Perryman, Richards, and Holbrook 1957). We have studied this sensitivity and tried to apply it therapeutically.

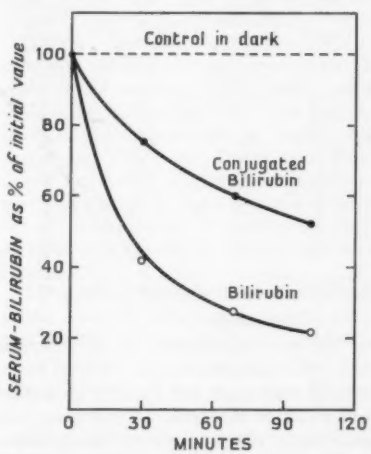

Fig. 3—Effect of sunlight on serum-bilirubin.

When icteric serum of infants is illuminated by white light, and the temperature is kept constant at 20°C, the characteristic 420 mμ absorption peak decreases and the absorption at the red end of the spectrum, around 550–650 mμ, increases a little (fig. 1). At the same time the measured serum-bilirubin level is reduced and electromotive force (E.M.F.) measurements show a positive increase in the oxidation/reduction (redox) potential of the system (fig. 2). This indicates that, under the action of light, bilirubin undergoes photo-oxidation or dehydrogenation to biliverdin or some intermediate products. These substances are more polar, and therefore probably more easily excretable, than is bilirubin.

Bilirubin (van den Bergh indirect pigment), the type of pigment greatly predominating in icteric infants, is some two or three times as photosensitive as is conjugated bilirubin (van den Bergh direct pigment) (fig. 3).

These findings emphasise the need for special precaution in laboratories doing routine bilirubin estimations on jaundiced infants. We now make a practice of enclosing all our blood-specimen tubes in light-tight containers if immediate analysis is not feasible. We have found that specimens left in bright daylight may lose as much as 30% of their serum-bilirubin in an hour.

Fig. 4 shows the distribution of the photosensitivity effect over the visible spectrum.

Clinical Applications

The subjects chosen for this study were all infants in the premature babies unit of the hospital. The sister in charge of the unit had earlier reported the apparent fading away of the yellow pigmentation in the skin of jaundiced babies when they had been a short time in sunlight. It was decided, therefore, to expose jaundiced infants to sunlight and assess the results quantitatively by serial determinations of serum-bilirubin.

Before the exposure the general trend of the serum-bilirubin level was established by the micro-method devised for this

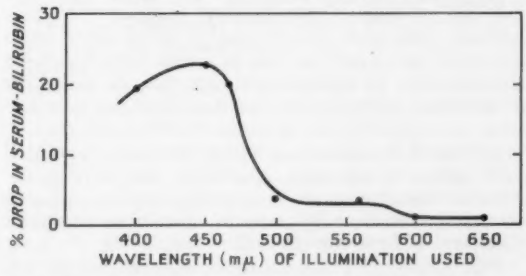

Fig. 4—Spectral distribution of the photodestruction of serum-bilirubin.

purpose (Perryman, Richards, and Holbrook 1957). To avoid overheating or excessive ultraviolet radiation, the babies were placed naked in direct sunlight for fifteen to twenty minutes (according to the sun's intensity) and then withdrawn for similar periods before again being exposed to the sunlight. During the exposure the infants' eyes were protected by a simple plastic shield.

Jaundice quickly disappeared from the exposed areas of skin but persisted in areas which remained in the shade.

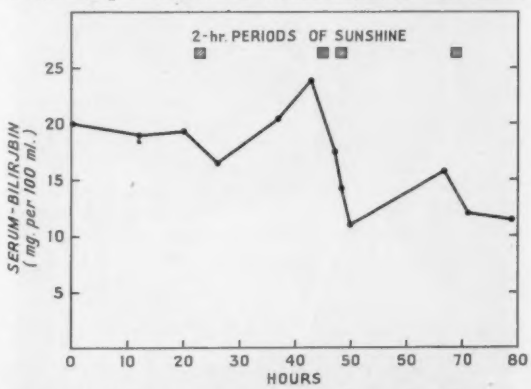

Fig. 5—Sunshine treatment of an icteric infant with jaundice of prematurity (case 6).

TABLE I—EFFECT OF SUNLIGHT ON ICTERIC INFANTS

Case no.	Birth-weight (lb. oz.)	Day of life	Serum-bilirubin before treatment (mg. per 100 ml.)	Duration of exposure (hours)	Resulting decrease in serum-bilirubin (mg. per 100 ml.)
1	5 2	6	25	2	4
2	5 2	5	24	3	6
		7	16	2	4
3	4 5	5	21	2	7
4	3 4	4	20	2	6
5	8 2	5	20	4	7
6	5 0	3	24	4	12
		4	19	2	2
		5	16	2	4
7	5 9	5	19	3	4
		6	15	2	2
8	4 5	2	18	3	2
		4	16	3	2
9	3 3	5	16	2	4
10	5 3	5	19	3	4
		6	15	3	2
11	3 12	5	12	2	3
12	5 14	3	11	2	4
13	5 3	4	10	2	−2
		5	12	2	0

After this intermittent sunlight treatment, bilirubin levels were again measured.

Fig. 5 shows a typical result of this treatment. Table I records the initial level and drop in serum-bilirubin in 13 premature infants with twenty test exposures. These had the so-called "physiological jaundice" of prematurity, and in all (except case 13, where there was a rise) there was a definite drop in serum-bilirubin during the exposure. In general, we found that the higher the initial serum-bilirubin level and the longer the exposure-time, the greater the fall in serum-bilirubin.

In view of these results, we sought a source of artificial light instead of sunshine. Guided by our work on the spectral distribution of the photosensitivity (fig. 4), we examined various light sources. Finally the apparatus illustrated in fig. 6 was devised.

This consists of a hemicylindrical stainless-steel reflector suspended on a movable gantry and adjustable for height. Eight 24 in. light blue fluorescent 40-watt discharge tubes (G.E.C.), at 2 in. separation, are arranged around the curve of the reflector. The equipment is so made that a cot may be wheeled beneath the lights, and switch-gear provides that the illumination can be cut if less than the full power is desired. This equipment gives light of very high intensity in the region of 420–480 mμ without any dangerous ultraviolet or X-ray components. The height of the lamp from the infant is adjusted to make use of the small amount of radiant heat emitted for keeping the infant's body-temperature at 98–100°F.

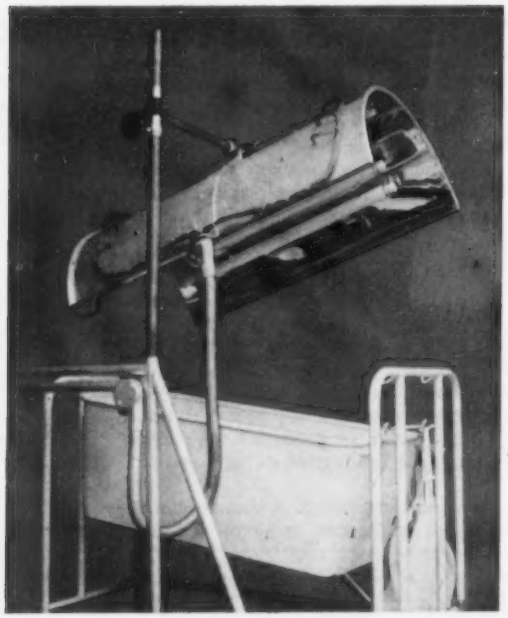

Fig. 6—Artificial-light apparatus for cradle illumination of infants.

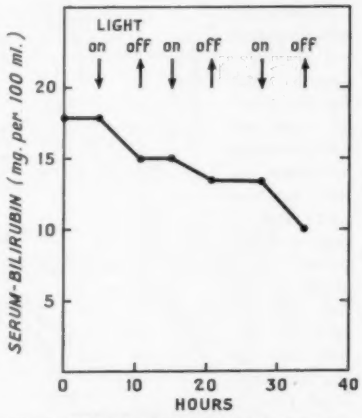

Fig. 7—Effect of artificial-light treatment on a jaundiced premature infant (case 16).

Fig. 7 shows the effect of this source of artificial light on an icteric premature infant; the coincidence of the drop in serum-bilirubin with the period of illumination is noteworthy.

TABLE II summarises the results of twelve light-exposure tests in 9 jaundiced premature infants. These all show small but significant drops in serum-bilirubin. At first continuous illumination was used, but in the light of experience a routine of six hours in the lights followed by two hours out seems to give better results. 2 infants with severe jaundice due to Rh incompatibility are not included in table II. These failed to respond to the light treatment and exchange transfusion was necessary.

TABLE II—EFFECT OF ARTIFICIAL LIGHT ON ICTERIC INFANTS

Case no.	Birth-weight (lb. oz.)	Day of life	Serum-bilirubin before treatment (mg. per 100 ml.)	Duration of exposure (hours)	Resulting decrease in serum-bilirubin (mg. per 100 ml.)
14	7 1	11	22	24	8
		12	14	20	3
		13	12	20	3
15	3 12	5	18	6	3
		6	14	6	3
16	4 12	5	19	36*	8
17	6 8	1	10	12*	5
18	6 14	1	13	24*	6
19	5 0	6	15	18*	6
20	5 3	8	14	18*	4
21	5 10	5	10	12*	2
22	6 7	4	12	24*	2

* Intermittent illumination: 6 hours on, followed by 2 hours off.

Discussion

Our results so far are insufficient for a complete statistical appraisal, but they encourage further work. From our biochemical studies, it has become clear that a complex series of chemical changes is involved.

Under the action of light, bilirubin seems to be dehydrogenated, and the role of hydrogen acceptors and photocatalysts is being investigated. Several compounds accelerate the photodestruction of serum-bilirubin in vitro—e.g., methylene-blue at a concentration of 10 μg. per ml. of serum; similarly toluidine-blue and cresyl-blue, though they are less effective, and riboflavine. We suggest that the difference in degree of response to light treatment between one jaundiced infant and another and also the complete failure of some to respond may be related to lack of essential hydrogen acceptors

or other factors in the circulating plasma. We have found that in the first few days of life cœruloplasmin is absent from the blood-serum, which may have a bearing on this problem.

No prospect can be entertained that this light treatment will prove a substitute for exchange transfusion in the erythroblastotic infant with active hæmolysis, but the method may be turned to clinical advantage in controlling the level of serum-bilirubin in cases of jaundice of prematurity.

Summary

In some cases of neonatal jaundice the serum-bilirubin level is reduced by sunlight or by suitable artificial-light treatment.

We should like to thank Dr. R. H. Dobbs, consultant pædiatrician to this group, for his interest and encouragement, and Prof. G. H. Lathe, of Leeds. We are indebted to the group engineering department of the Southend Hospitals for the design and manufacture of the cradle illumination machine.

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ACTION OF CITRATE AND OXALACETATE ON DIETARY AND DIABETIC KETOSIS

PAOLO FASELLA M.D. ASSISTANT

CORRADO BAGLIONI M.D. ASSISTANT

CARLO TURANO MEDICAL STUDENT

NORIS SILIPRANDI M.D., D.Chim. PROFESSOR

INSTITUTE OF BIOLOGICAL CHEMISTRY IN THE UNIVERSITY OF CAMERINO, ITALY

THE effect of ketosis on the administration of Krebs-cycle metabolites has been extensively studied as a tentative approach to knowledge of this pathological condition. It may be assumed, in fact, that ketosis develops whenever acetyl radicals are inadequately metabolised via the Krebs cycle, owing to a deficient availability of oxalacetate. This pathogenic mechanism has also been postulated for diabetic ketosis (Thompson and King 1957); but Beatty and West (1955) did not detect any effect of the administration of succinic acid and malic acid on the ketonuria of alloxan-diabetic rats fed on Wesson oil; consequently they suggest that a deficiency of oxalacetic acid is not the cause of diabetic ketosis.

To provide further evidence on this question the action of citrate and oxalacetate on experimental dietary and diabetic ketosis has been examined.

Material

The rat and the dog were chosen for experimenting on because there is evidence that, in both species, the pathogenic mechanism of dietary ketosis (Crandall 1941, Deuel 1957) and alloxan-diabetic ketosis (Lukens 1948, Hoet and Young 1954) is essentially the same as in man. However, because of the difficulty of obtaining stable ketosis of exclusively diabetic origin in the rat (Beatty and West 1955) and dietary ketosis in the dog (Crandall 1941) each type of ketosis was investigated in only one of these animal species. Nevertheless a comparison between the results seems legitimate because, as mentioned above, the pathogenic mechanisms are essentially the same in the two species.

TABLE I—EFFECT OF CITRIC ACID AND OXALACETIC ACID ON DIETARY KETOSIS

Treatment	No. of experiments	Ketone bodies (mg. per 100 g. of body-weight in 24 hr.)
Fasted 24 hr.	8	1·0±0·5
Butyric acid	5	6·9±2·6
Butyric acid + 4·5 mM of oxalacetate	4	2·3±0·7
Butyric acid + 4·5 mM of citrate	4	1·6±0·7
Butyric acid + 6·0 mM of oxalacetate	4	0·6±0·3
Butyric acid + 6·0 mM of citrate	4	0·7±0·4

TABLE II—TYPICAL EXAMPLE OF EFFECT OF CITRATE AND OXALACETATE ON BLOOD-SUGAR AND KETONE-BODY LEVELS OF ALLOXAN-DIABETIC DOG FASTED FOR 6 HR.

Administration of	Substance	Blood-level (mg. per 100 ml.)		
		Before administration	90 min. after administration	180 min. after administration
Citrate Na salt	Sugar	380·0	470·0	380·0
	Ketone bodies	16·7	16·5	15·0
Oxalacetate Na salt	Sugar	310	380·0	330·0
	Ketone bodies	25·3	23·3	22·3

Dietary ketosis was induced by feeding butyrate to female albino rats; the 24-hr. urinary excretion of ketone bodies was determined by the method described by Greenberg and Lester (1944) with and without administration of citrate and oxalacetate (table I). A 10% solution of butyric acid adjusted to pH 6·0 was administered in the dose of 2 ml. per 100 g. of body-weight by stomach-tube to rats fasted 15 hr. The millimols of the test substances injected intraperitoneously denote the dosage per kg. of body-weight for 24 hr. Oxalacetate was prepared according to the method described by Heidelberger (1953).

Experimental details and results are reported in table I.

Diabetic ketosis was studied in alloxan-diabetic dogs; blood-sugar and ketone-bodies levels were determined before and after intravenous injection of citrate and oxalacetate (table II). Blood-sugar levels were determined by the method described by Somogyi (1945), and ketone bodies, expressed as acetone by that of Greenberg and Lester (1944). Citrate and oxalacetate were administered intravenously in a single dose of 3 mM per kg. of body-weight. The time intervals between the administration and the determinations were chosen on the basis of Crandall's (1941) results and are reported with other experimental details and data in table II.

Results

The results show that dietary ketonuria is practically abolished by intraperitoneal injection of either citrate or oxalacetate.

Diabetic ketosis, on the other hand, is not significantly influenced either by citrate or by oxalacetate injected intravenously.

The discrepancy between the results obtained in diabetic and in dietary ketosis suggests that the pathogenic mechanisms responsible for these two conditions are fundamentally different.

Diabetic ketosis may not be attributable, as dietary ketosis is, to a deficiency of oxalacetate or of citrate but rather, according to Beatty and West (1955), to a disturbance in the Krebs cycle.

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REVERSAL OF URINARY DIURNAL RHYTHM FOLLOWING HEAD INJURY

R. W. PAYNE
M.A., M.B. Cantab.
DEMONSTRATOR IN CHEMICAL PATHOLOGY

H. E. DE WARDENER
M.B.E., M.D. Lond., M.R.C.P.
SENIOR LECTURER IN MEDICINE

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, LONDON, S.E.1

THE presence of a diurnal rhythm of urinary excretion is well established (Vogel 1854, Quincke 1877, Simpson 1924, Norn 1929, Manchester 1933, Gerritzen 1940, Borst and de Vries 1950, Stanbury and Thomson 1950). Reversal of this rhythm has been reported in various conditions in which generalised œdema occurs—e.g., congestive cardiac failure, malnutrition, cirrhosis of the liver, and the nephrotic syndrome (Quincke 1893, Sinclair 1949, Borst and de Vries 1950, Stanbury and Thomson 1951, Goldman 1951). The normal rhythm is also reversed in habitual night-workers (Norn 1929) and in some cases of Addison's disease (Levy et al. 1946).

This paper describes a case in which reversal of the urinary diurnal rhythm followed a head injury. The normal pattern of diurnal rhythm was also studied in five normal subjects under identical conditions.

Material

Patient

A man, aged 40, was admitted to hospital under the care of Prof. F. T. G. Prunty in November, 1956, for investigation of progressive obesity accompanied by nocturia. Apart from malaria and bacillary dysentery in 1936, he had been fit until July, 1945, when he was involved in a motor-cycle accident and was unconscious for several hours. He had retrograde amnesia covering three days and post-traumatic amnesia covering seven days. There was no external wound, but radiography revealed a fracture of the left parietal bone. The patient was in hospital four months. Electroencephalography before his discharge showed nothing abnormal. In January, 1946, he began to have attacks of jacksonian epilepsy involving the left angle of his mouth, and in spite of phenobarbitone therapy he continued to have three or four mild attacks a year.

RESULTS

—	Subject	Mean excretion (per 24 hr.)	% of total daily excretion per 4 hr. collection period *					
			From 8 P.M. to midnight	From midnight to 4 A.M.	From 4 A.M. to 8 A.M.	From 8 A.M. to noon	From noon to 4 P.M.	From 4 P.M. to 8 P.M.
Volume of urine	*Healthy volunteers:*							
	No. 1	1690 ml.	13	7	6	19	35	20
	No. 2	1761 ,,	14	8	7	28	29	14
	No. 3	2377 ,,	11	8	4	12	35	30
	No. 4	1509 ,,	23	10	9	15	22	21
	No. 5	2389 ,,	12	8	6	18	34	22
	Patient	1883 ,,	19	25	21	12	12	11
Osmolality	*Healthy volunteers:*							
	No. 1	(m. Osm./kg.	935	1039	1095	825	649	774
	No. 2	,,	811	825	898	452	516	668
	No. 3	,,	749	693	897	690	330	320
	No. 4	,,	734	841	963	877	682	597
	No. 5	,,	747	782	867	601	372	501
	Patient	,,	470	380	570	700	820	830
Total solutes	*Healthy volunteers:*							
	No. 1	1245 m. Osm.	16	12	8	20	27	17
	No. 2	1620 ,,	20	11	10	19	26	14
	No. 3	1545 ,,	17	12	10	12	27	22
	No. 4	1655 ,,	22	12	9	18	21	18
	No. 5	1940 ,,	18	10	10	19	23	20
	Patient	1073 ,,	16	17	20	14	17	16
Creatinine	*Healthy volunteers:*							
	No. 1	2629 mg.	17	14	14	17	20	18
	No. 2	2147 ,,	18	16	14	16	19	17
	No. 3	2134 ,,	18	15	14	14	21	18
	No. 4	2128 ,,	18	15	14	18	18	17
	No. 5	2168 ,,	19	15	14	17	17	18
	Patient	1670 ,,	19	18	15	13	18	17
Sodium	*Healthy volunteers:*							
	No. 1	259 mEq.	17	7	4	21	36	15
	No. 2	243 ,,	20	9	6	21	29	15
	No. 3	198 ,,	18	9	5	10	32	26
	No. 4	218 ,,	27	13	5	15	22	18
	No. 5	265 ,,	19	8	7	19	26	21
	Patient	201 ,,	19	18	21	14	15	13
Potassium	*Healthy volunteers:*							
	No. 1	98 mEq.	17	10	10	25	27	11
	No. 2	95 ,,	23	9	12	18	24	14
	No. 3	77 ,,	16	8	11	17	32	16
	No. 4	105 ,,	19	7	5	28	29	12
	No. 5	89 ,,	13	5	9	29	34	10
	Patient	88 ,,	12	14	26	15	18	15
Phosphate	*Healthy volunteers:*							
	No. 1	1130 mg.	23	23	16	6	14	18
	No. 2	996 ,,	24	19	8	9	22	18
	No. 3	973 ,,	20	25	11	14	10	20
	No. 4	1069 ,,	21	24	17	10	11	17
	No. 5	1061 ,,	22	14	10	9	19	26
	Patient	1047 ,,	18	14	14	8	24	22
Chloride	*Healthy volunteers:*							
	No. 1	295 mEq.	15	6	6	23	35	15
	No. 2	284 ,,	16	8	7	22	26	21
	No. 3	224 ,,	14	6	7	14	35	24
	No. 4	254 ,,	26	9	5	20	16	24
	No. 5	284 ,,	17	5	7	22	30	19

* Values are percentages of mean total daily output except osmolality, which is mean of each period for three days.

He denied any symptoms resembling narcolepsy and stated that his sleep pattern was normal. Until 1945 his weight remained steady at about 64 kg.; he then progressively gained weight, and on admission he weighed 118 kg. He had not noticed any great increase in appetite, nor did he complain of excessive thirst. In 1952 he started to pass urine once or twice during the night and had done so ever since. He had no other urinary symptoms, and he stated that he did not drink large amounts of fluid in the evening or during the night.

On physical examination, apart from generalised obesity, nothing abnormal was found.

Investigation of renal function revealed no abnormality: the specific gravity of the urine after deprivation of fluids was 1·028 and after the subcutaneous injection of vasopressin tannate 5 units it was 1·031. A twenty-four-hour creatinine clearance was 119 ml. per minute. A glucose-tolerance test was normal. The total daily urinary excretion of 17-ketosteroids and 17-ketogenic steroids and the response to corticotrophin were normal. A radiograph of the skull, a right carotid angiogram, and an electroencephalogram were within normal limits.

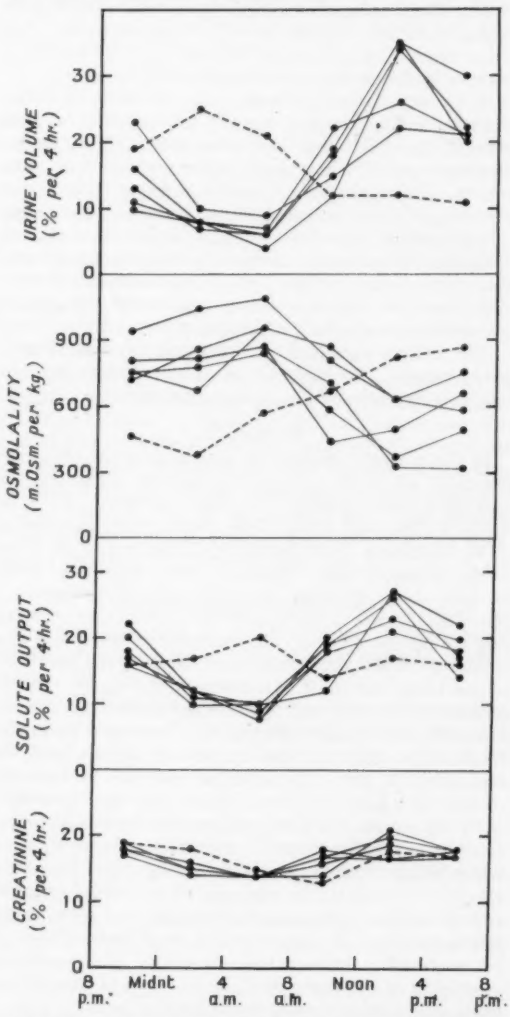

Fig. 1—Diurnal changes in the flow and osmolality of the urine, and in total solute and creatinine excretion in normal subjects (continuous lines), and in the patient (interrupted lines). Values are percentages of mean total daily output except for the osmolality, which is the mean for each period for three days.

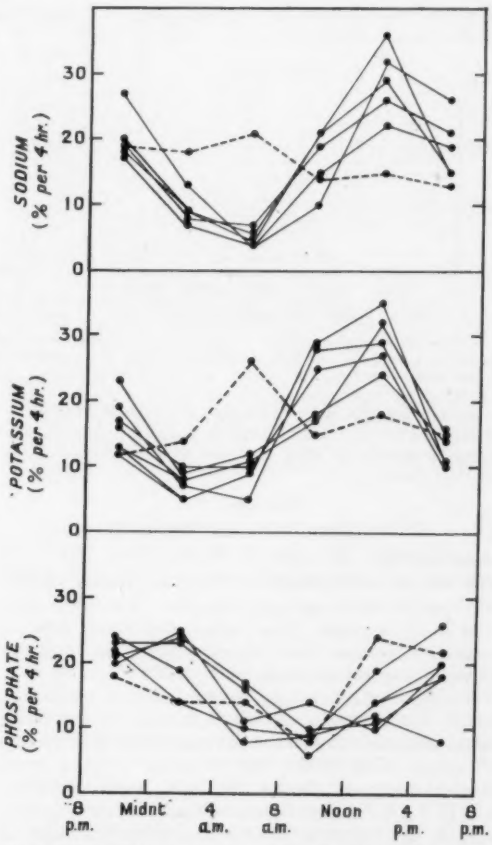

Fig. 2—Diurnal changes in urinary excretion of sodium, potassium, and phosphate in normal subjects (continuous lines) and patient (interrupted line).

Healthy Volunteers

Five healthy male volunteers were admitted to the metabolic ward for investigation.

Methods

During the three-day period of study both the patient and the normal subjects were ambulant by day but remained in the ward. They were allowed to take as much food and fluids as they liked by day but nothing between 8 P.M. and 6 A.M. Urine was collected four-hourly from 8 P.M. for seventy-two hours, eighteen specimens being obtained from each person. To distract attention from the volume of urine, and to reduce emotional influences on the flow of urine, the controls were told that the investigation concerned the pattern of urinary excretion of 17-ketosteroids, and that this necessitated four-hourly collections of urine.

The volume of each specimen of urine was measured. The osmolality of the urine was determined by measuring the depression of its freezing-point with a thermistor (de Wardener and del Greco 1955); the concentration of sodium and of potassium in the urine with a Barclay flame-photometer using an internal standard; creatinine by the method of Peters (1942), chloride by the method of van Slyke and Hiller (1947), and phosphate by Briggs' (1922) method. The 17-ketosteroids and 17-ketogenic steroids were determined by Dr. R. V. Brooks using the method of Norymberski (Gibson and Norymberski 1954).

The constituents of each of the eighteen specimens of urine from each person were determined by the above methods. The mean outputs of the six corresponding four-

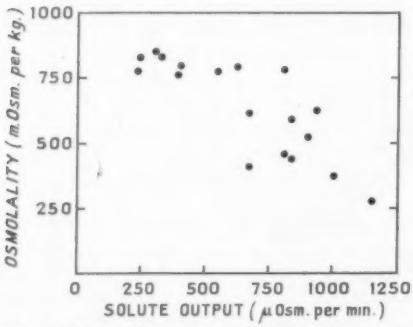

Fig. 3—Osmolality and excretion of solutes in all four-hour specimens of urine obtained from normal subject no. 5.

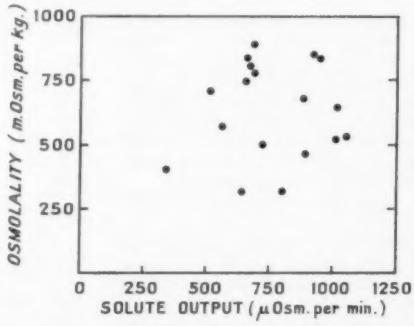

Fig. 4—Osmolality and excretion of solutes in all four-hour specimens of urine obtained from the patient.

hour periods each day were calculated, and from this the mean total daily output was determined. The mean output of each four-hourly period has been expressed as a percentage of the mean total daily output.

Results

The results are given in the accompanying table.

Normal Subjects

The normal subjects showed little day-to-day change in their pattern of urinary excretion, and the patterns were similar in all of them. The highest and lowest rates of excretion mentioned below represent the mean of all five subjects during any one four-hour period.

The output of water, total solutes, sodium, potassium, chloride, and creatinine increased during the day being greatest from noon to 4 P.M., and at this time the urine was most dilute. Conversely, the excretion of these same substances decreased during the night, being least from 4 A.M. to 8 A.M., except for potassium which was usually lowest in the previous period—i.e., from midnight to 4 A.M. The urine was most concentrated from 4 A.M. to 8 A.M. (figs. 1 and 2).

The excretion of water, sodium, potassium, and chloride showed the greatest diurnal changes; their highest excretion-rate was usually at least four times their lowest. Changes in the output of total solutes were less marked, the highest excretion-rate being less than three times the lowest. The excretion of creatinine fluctuated even less, the highest excretion-rate being 1·4 times the lowest. There was an inverse relationship between the total output of solutes and the osmolality of the urine (fig. 3).

The rhythm of the urinary excretion of phosphate was the reverse of the other substances studied and was more variable both from one person to another and from day to day. The highest excretion-rate was from 8 P.M. to midnight and the lowest from 8 A.M. to noon (fig. 2).

Four-hour excretion-rates of 17-ketosteroids and 17-ketogenic steroids were variable but were lowest by night and highest in the forenoon; in some subjects they rose again in the evening. Changes in the excretion-rates of these steroids seemed to be unrelated to changes in the excretion-rates of the other constituents of the urine.

Patient

In the patient the diurnal rhythms of urinary excretion of all the substances studied differed from those found in the normal subjects, but were consistent from day to day.

The output of water, total solutes, sodium, potassium, and creatinine increased during the night. The highest excretion-rate of water was from midnight to 4 A.M. and preceded the highest excretion-rate of total solutes, sodium, and potassium by four hours. The urine was most dilute during the period of highest water excretion.

Throughout the day the output of water, total solutes, sodium, and potassium was less than during the night, and there was little difference between the three periods. The concentration increased during the day and was greatest from 4 P.M. to 8 P.M. The pattern of excretion of creatinine was similar to that in the normal subjects; but the lowest excretion-rate was four hours later, from 8 A.M. to noon; it was unrelated to changes in the output of total solutes (fig. 1).

As in the normal subjects, the excretion of water, sodium, and potassium showed the greatest diurnal changes, but they were less pronounced. The highest excretion-rates of water and potassium were about twice, and those of sodium and total solutes only 1·5 times the lowest. There was no relationship between the output of total solutes and the osmolality of the urine (fig. 4).

The pattern of urinary excretion of phosphate resembled that in the normal subjects, but both the lowest (8 A.M.–noon) and the highest (noon-4 P.M.) rates occurred by day and in consecutive periods (fig. 2).

The urinary excretion of 17-ketosteroids and 17-ketogenic steroids was variable, as in the normal subjects, but appeared to show a normal diurnal rhythm.

Discussion

In the normal subjects, the diurnal patterns of urinary excretion of water, sodium, potassium, chloride, and creatinine were similar to those observed by other workers (Simpson 1924, 1926, Norn 1929, Manchester 1933, Gerritzen 1940, Smits 1947, Borst and de Vries 1950, Stanbury and Thomson 1950, Goldman 1951). It was also confirmed that the urinary excretion of phosphate varies considerably more than that of water and strong electrolytes. The excretion of water and total solutes decreased during the night, whereas the osmolality of the urine increased. In contrast, during the day the excretion of water and total solutes increased, and the osmolality of the urine decreased. There was an inverse relationship between the output of solutes and the osmolality of the urine, and the rhythms of excretion of water and osmolality total solutes were synchronous.

In the patient the most striking feature was a reversal of the normal pattern of excretion of water, more water being excreted by night than by day. There was also a reversal of the diurnal rhythm of urinary excretion of total solutes, sodium, and potassium, and some change in the excretion of phosphate and creatinine. There was no relationship between the output of solutes and the osmolality of the urine, and the rhythms of excretion of water and total solutes were not synchronous.

The rate of flow of the urine is determined by (1) the concentration of antidiuretic hormone (A.D.H.) in the plasma (Verney 1946), (2) the tubules' capacity to respond to A.D.H. (Epstein et al. 1957, de Wardener and

Herxheimer 1957), and (3) the rate of solute output (McCance 1945, de Wardener and del Greco 1955). The nocturia in this patient appears to have been induced by a change in at least two of these mechanisms. Unless large amounts of vasopressin are administered, it is impossible to differentiate between (1) and (2); but one of these two mechanisms must have been responsible for the evening rise in urine flow and fall in urine concentration (from 830 to 470 m. Osm. kg. of the urine in the periods 4 P.M.-8 P.M. and 8 P.M.-midnight, because the output of solutes in these two periods was identical. Nevertheless in the following period (from midnight to 4 A.M.) the high rate of urine flow was maintained, at least in part, by an increased output of total solutes. This occurred at a time when the initial cause of the nocturnal diuresis was waning, for as the solute output rose the urine became more concentrated. It is therefore concluded that the increased excretion of water at night in the patient was due to a nocturnal increase in the output of solutes, and in addition to at least one of the two mechanisms which are independent of the output of solutes.

It is probable that in normal subjects the diurnal variation in water excretion is also controlled by factors other than the solute output, though this is not apparent under normal conditions. Lewis and Lobban (1956), for instance, have shown that the diurnal rhythm of urinary excretion of water and that of electrolytes can become dissociated in certain circumstances. In addition, Lewis and Lobban (1956) and Mills and Thomas (1957) have shown that the diurnal excretion of individual electrolytes may vary independently. These findings suggest that the mechanisms responsible for the diurnal rhythms of the urinary excretion of water and of individual electrolytes are independent.

In the present patient a reversal and dissociation of the normal urinary diurnal rhythms of water and electrolyte secretion followed a head injury, and was associated with the onset of epilepsy and obesity. This suggests that the site of the control of the various mechanisms responsible for the diurnal rhythms of urinary excretion is in the brain, possibly in the hypothalamus—a suggestion previously advanced by Mills (1951) and by Lewis et al. (1956) from their experiments on normal subjects.

Summary and Conclusions

A case is reported in which reversal of the urinary diurnal rhythm, epilepsy, and obesity followed a head injury.

The daily patterns of urinary excretion of water, total solutes, sodium, potassium, chloride, phosphate, and creatinine and of urine osmolality were studied in five normal subjects and compared with those in the patient.

The high rate of excretion of water at night in the patient appears to have been due to an increase in solute output, and to a mechanism independent of the solute output.

It is suggested that the mechanisms responsible for the diurnal rhythms of urinary excretion of water and electrolytes are independent.

It is further suggested that the site of control of these mechanisms is in the brain, possibly in the hypothalamus.

We wish to thank Prof. F. T. G. Prunty for encouragement and permission to publish; Dr. R. R. McSwiney for helpful criticism; Dr. R. V. Brooks for estimating the urinary steroids; the volunteers; the sisters and nurses for their helpful cooperation; the staff of the William Dunn Laboratory (especially Mr. R. Hurst, Mr. R. Smith, Mr. R. Hale, and Miss S. Jones); and Miss J. Bethell for technical assistance.

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EXTENT OF THE INFARCT IN THE ANTERIOR LOBE OF THE HUMAN PITUITARY GLAND AFTER STALK SECTION

P. M. DANIEL *
M.A., D.M. Oxon., M.R.C.P.
PROFESSOR OF NEUROPATHOLOGY IN THE UNIVERSITY OF LONDON, AT THE INSTITUTE OF PSYCHIATRY, MAUDSLEY HOSPITAL, S.E.5

MARJORIE M. L. PRICHARD
M.A., D.Phil. Oxon.
SENIOR RESEARCH OFFICER, NUFFIELD INSTITUTE FOR MEDICAL RESEARCH, UNIVERSITY OF OXFORD

P. H. SCHURR
M.A., M.B. Cantab., F.R.C.S.
NEUROSURGEON, GUY'S HOSPITAL AND THE BETHLEM ROYAL AND MAUDSLEY HOSPITALS

A QUESTION of considerable importance, both to neurosurgeons and to those interested in the treatment of cancer, is the efficiency, or otherwise, of section of the pituitary stalk as a means of producing necrosis of the anterior lobe of the gland. Although stalk section is simpler than total hypophysectomy, its efficacy is not yet proved.

The following case shows the extent of the lesion produced.

Case-report

A woman, aged 39, had had a left radical mastectomy performed by Mr. J. Heriot of King's College Hospital in July, 1956. She remained well till March, 1957, when she was found to have a left pleural effusion. She was given methyl testosterone and in July was admitted to the Guy's-Maudsley neurosurgical unit (no. 1767). She now had metastases on the left lower chest wall; the left pleural cavity was virtually obliterated by growth, and there were metastases in bones.

At the urgent request of the patient and her relatives, an operation was performed on Aug. 9 (P. H. S.). A frontal osteoplastic flap was turned and the right frontal lobe was raised to expose the pituitary stalk. This was cut and a plate of cold-curing resin,† shaped to fit beneath the optic chiasma and over the diaphragma sellæ, was inserted to separate the cut ends of the stalk and thus prevent any possible regrowth of vascular connections (fig. 1) (Harris 1950, Harris and Jacobsohn 1952, Jacobsohn 1954).

* Assisted by a grant from the Bethlem Royal and Maudsley Hospital Research Fund.

† 'Simplex pentacryl'; Dental Fillings, Ltd., 49, Grayling Road, London, N.16.

Eight days later the patient developed congestive cardiac failure and pericarditis. She died on Aug. 28.

Necropsy
(P. M. D.)

There were multiple secondary deposits of carcinoma, and severe bronchopneumonia. The brain showed minimal operative trauma and contained no secondary deposits. The plastic plate (fig. 1) lay in excellent position over the diaphragma sellæ. At the proximal cut end of the pituitary stalk was a little rounded knob resembling a tiny neuroma on a peripheral nerve—an appearance which we have commonly seen after hypophysectomy.

Fig. 1—Photograph, taken at necropsy, after removal of the brain, showing the plastic plate in situ, lying beneath the optic chiasma.

Findings in the Pituitary Gland

The gland was fixed in formol-saline and cut sagittally into five blocks and embedded in paraffin wax. Sections were taken from one surface of each block and stained with hæmatoxylin and eosin, iron hæmatoxylin and van Gieson's mixture, Mallory's trichrome method, Heidenhain's azan method, Mann's method, and the periodic-acid Schiff method.

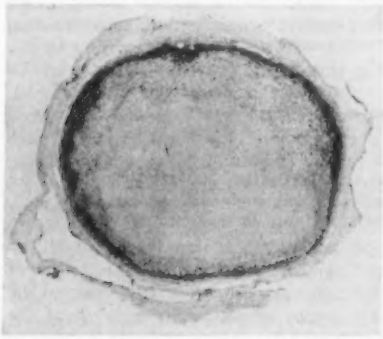

Fig. 2—Sagittal section through the lateral part of the pituitary. Only anterior-lobe tissue is present. Note the massive infarct (pale) and the narrow peripheral rim of surviving anterior-lobe cells (dark) (hæmatoxylin and eosin. ×9).

The sections showed extensive infarction of the anterior lobe. There was a narrow rim of living cells all round the periphery; but deep to this, in the lateral portions, the epithelial tissue was wholly necrotic (fig. 2). In the median part of the gland the infarct was confined to the anterior (ventral) half of the anterior lobe; and the cells in the posterior (dorsal) half were alive (fig. 3). The situation and the extent of the living and necrotic tissue is shown in fig. 4, which is a reconstruction based on sections taken from the five blocks.

From the infarct the epithelial cells had completely disappeared: the whole of its central area was occupied by structureless debris with no nuclear remains. Round the periphery of this structureless mass there was a layer of young granulation tissue. The boundary between the granulation tissue and the living cells was sharply defined. No inflammatory cells were present around the infarct. In the living anterior-lobe tissue, the sinusoids were dilated and filled with red cells, and the tissue in general appeared œdematous; the epithelial cells, though alive, appeared distinctly abnormal. They were, on the whole, unusually small, had lost their regular arrangement, and tended to be heaped together in irregular, closely packed groups. Many cells had a glassy acidophilic cytoplasm, and few showed any distinct intracytoplasmic granules.

The posterior (neural) lobe was invaded by carcinoma cells, which is not unusual in mammary carcinoma. In this case the lobe was probably invaded before the stalk was cut. The neural tissue itself was shrunken and fibrotic; there was also an apparent increase in the cellularity of this tissue and in the number of blood-vessels. These latter appearances were similar to those seen in the posterior lobe of goats 3–4 weeks after pituitary-stalk section (Daniel and Prichard 1958).

Comment

The large extent of the infarct in the anterior lobe in this case is evidence that most of the anterior lobe derives its blood-supply from the long hypophysial portal vessels of the pituitary stalk, which were severed at operation. The posteromedian area of the anterior lobe survived because this area is supplied by the short hypophysial portal vessels, which have their origin in the lower infundibular stem (fig. 5), and this is supplied by the intact inferior hypophysial arteries.

Fig. 3—Approximately mid-sagittal section through the pituitary. Posterior lobe (somewhat fragmented and with carcinoma tissue in it) seen on the left. In this plane there is an area of surviving anterior-lobe tissue (dark) occupying the posterior half of the anterior lobe, but this area was confined to a median zone (see fig. 4). On the right the anterior lobe is infarcted (pale area) (hæmatoxylin and eosin. ×7½).

The anterior lobe of the human pituitary has no direct arterial blood-supply (Xuereb, Prichard and Daniel 1954a). This is also the case in some animals (but not the rabbit), and a comparable picture of massive infarction of the anterior lobe is regularly seen in sheep, goats, and rats after pituitary-stalk section or cauterisation of the hypophysial portal vessels in the pituitary stalk (Daniel and Prichard 1956, 1957a, 1957b, 1957c, 1958). These animals, like our patient, have a small area of surviving anterior-lobe tissue, which does not derive its blood-supply from the stalk and also a narrow peripheral rim of surviving anterior-lobe cells, whose survival we attribute to the diffusion of oxygen and metabolites from the adjacent, highly vascular, dura mater.

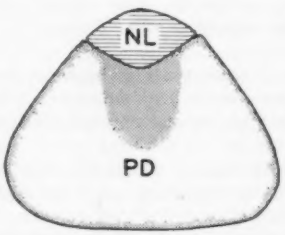

Fig. 4—Diagrammatic horizontal section through the pituitary (reconstructed from sections) showing extent of the infarct (pale) and the surviving tissue (dark) in the anterior lobe (P.D.). N.L., neural (posterior) lobe.

Fig. 3 alone is misleading as to the extent of the infarct. The

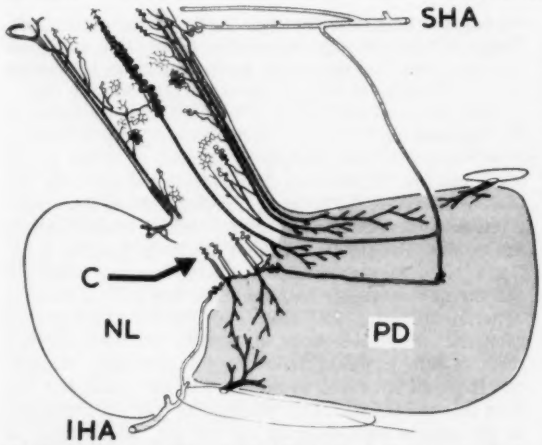

Fig. 5—Diagram showing the blood-supply of the anterior lobe (P.D.) of the human pituitary, in sagittal section.

Section through the pituitary stalk does not interfere with the blood-supply to the capillary loops (c) in the lower infundibular stem. It is the blood-flow through the short portal vessels draining these capillary loops which has kept alive the posteromedian area shown in figs. 3 and 4.

N.L., neural (posterior) lobe; S.H.A., superior hypophysial artery; I.H.A., inferior hypophysial artery. (This diagram is modified from fig. 16, Xuereb et al. 1954b, and further explanations will be found in that paper.)

large mass of living epithelial cells seen here is, in fact, confined to a narrow median strip; and sections from the more lateral blocks (fig. 2) show that much the greater part of the lobe is necrotic (fig. 4). To see the extent of the necrosis at a glance it would be wise to cut the pituitary horizontally, as was done by Russell (1956), who demonstrated very similar appearances.

Our patient survived for 3 weeks after operation. In goats (Daniel and Prichard 1958), results were very similar to those reported here, and there was a suggestion of some regeneration of anterior lobe cells after a few days.

In the goats, as in our patient, the abnormal appearance of the epithelial cells surviving in the anterior lobe was very striking. This appearance, we believe, indicates that the living cells had lost much of their functional activity as a result of the stalk section, because the remaining part of the primary capillary bed (in the lower infundibular stem) had been "denervated" by section of the pituitary stalk. The neural component of the neurovascular link between the hypothalamus and the anterior lobe, which Green and Harris (1947) and Harris (1955a, 1955b) consider essential for the proper maintenance of anterior-lobe function, was now missing.

The degeneration of the neural tissue in the posterior lobe was not, we think, primarily due to carcinomatous infiltration, since the same picture was seen in the posterior lobes of the goats 3–4 weeks after stalk section, and is only to be expected after section of the nerve tracts.

Summary and Conclusions

In a woman with carcinomatosis, section of the pituitary stalk led to infarction of the anterior lobe except for the posterior half of the median part and a few cells round the periphery. (The full extent of the necrosis in the anterior lobe after section of the pituitary stalk is not revealed by median sagittal sections.)

Section of the pituitary stalk in man will not cause necrosis of the entire anterior lobe of the pituitary gland. But even in "total" hypophysectomy fragments of this lobe are almost always left behind in the sella turcica; and this residual tissue may be found in patients with a successful remission of the malignant growth. Moreover, all reports of extensive infarction of the anterior lobe in man mention a narrow peripheral layer of surviving anterior-lobe cells. However, from experimental work on animals, it seems probable that any surviving cells, when isolated from the hypothalamus either by pituitary stalk section or by subtotal hypophysectomy, have their secretory activity so much reduced that they are no longer endocrinologically important. Histologically they are abnormal in appearance.

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GANGRENE OF THE EXTREMITIES FOLLOWING CARDIAC INFARCTION AND NORADRENALINE THERAPY

D. GREENBAUM
M.B. Lond., M.R.C.P.
MEDICAL REGISTRAR, LONDON HOSPITAL, E.1

SYMMETRICAL peripheral gangrene is a rare complication of heart-disease with circulatory failure. The following case is of interest in that the gangrene was of unusual extent and the patient had been treated with noradrenaline.

Case-report

A man, aged 56, was admitted to the London Hospital on Aug. 18, 1957, having collapsed three hours before with severe lower substernal pain. There was no previous history of significant ill health.

On examination his extremities were cold and blue, his skin was pale and clammy, and his temperature was 95·5°F. His pulse was feeble, rhythm regular, rate 40, and apex-beat impalpable, and the heart sounds were distant, with gallop rhythm. There was no jugular venous distension, and no crepitations were heard at the lung bases. The blood-pressure was 80/50 mm. Hg. Electrocardiography showed gross ST and T changes in all leads and complete heart-block.

Treatment and course.—Morphine and anticoagulants were given, the latter being discontinued after a vomit of about a pint of blood twelve hours later. Four hours after admission there was no change in the patient's general condition and blood-pressure and an intravenous infusion of noradrenaline 1 : 200,000 in 5% glucose was begun. The concentration was increased to 1 : 100,000 after about an hour to reduce the amount of intravenous fluid given. The blood-pressure rose almost immediately and was maintained at about 110 mm. Hg systolic and 70 mm. Hg diastolic. The pulse-rate rose to 80, and electrocardiography showed that sinus rhythm had returned. There was also concurrent improvement in the patient's general condition. The infusion was maintained for sixty-eight hours, after which the blood-pressure spontaneously remained normal. 20 mg. of noradrenaline was given on the first day, 16 mg. on the second day, and 8 mg. on the third, the rate of infusion being adjusted according to the blood-pressure.

Ordinary transfusion needles were used and the site of infusion was changed twice—at points just above the wrist in both arms, and above the internal malleolus in the right leg. Towards the end of the third day the peripheral pulses became difficult to feel. On the fourth day the patient complained of stiffness of the fingers of his left hand, and during the next two days patches of gangrene appeared on his hands and feet. Thereafter gangrene spread gradually up all four limbs to the extent shown in the accompanying figure. No urine was passed during the first thirty-six hours. Measurements were not made after that, because of incontinence, but the flow appeared to be adequate, and a catheter specimen had a specific gravity of 1·025. The patient became delirious and progressively weaker and developed moderate engorgement of his jugular veins and a few crepitations at his lung bases. He died fourteen days after admission. The hæmoglobin on the fifth day was 70%, and the blood-urea on the day of death 212 mg. per 100 ml.

Gangrene of all four limbs.

Necropsy revealed extensive cardiac infarction. The whole of the posterior wall of the right ventricle, the posterior two-thirds of the interventricular septum, and the whole of the posterior wall of the left ventricle were necrotic. The left coronary artery, which rose from the right aortic sinus and wound round the aorta, was much smaller than usual, most of the blood-supply to the heart coming from the right coronary artery, which was occluded 2 cm. from its origin by a thrombus 4·5 cm. long surrounded by a crescent of atheroma. There was moderate atheroma throughout the aorta, and there were a few streaks in the carotid and femoral arteries. The limb arteries were shown either by dissection or injection radiography to be patent and apparently free from thrombus as far as the line of demarcation of the gangrene. There were a few petechial hæmorrhages in the stomach, the liver and the spleen were congested, and the kidneys appeared normal both to the naked eye and on microscope. There was moderate pulmonary œdema, and a few ante-mortem thrombi were found in some of the smaller pulmonary arteries. Apart from the limbs, the testes were the only organs to show ischæmic necrosis.

Discussion

Fishberg (1938) observed that, in heart-failure, the antecubital veins might be collapsed when the jugular veins were distended, and he postulated selective vasoconstriction conserving the circulation for vital organs. Freis et al. (1952) considered that peripheral vasoconstriction in cardiac infarction was a reflex mechanism produced by a reduction in the stroke-volume of the heart. Gangrene of the extremities may be considered to be an unfortunate effect of this compensatory mechanism.

During the past twenty years several reports of this complication have appeared. Perry and Davie (1939) observed it in hypertensive heart-failure, Abrahams (1948), reported incipient gangrene in paroxysmal tachycardia, and Swan and Henderson (1951), Schulz and Knobloch (1953), Bird et al. (1954), and Caserta et al. (1956) describe it in cardiac infarction.

In the present case the use of noradrenaline must have made an important contribution to the vasoconstriction that led to gangrene. The spread of the gangrene for eleven days after the infusion had been stopped indicates the equal or greater importance of the low cardiac output. These two factors may explain the remarkable extent of the gangrene. In the other published cases it usually involved little more than the tip of the nose and the digits.

Although local necrosis at or near the site of infusion is not uncommon, I have not been able to find a published report of symmetrical peripheral gangrene after the use of noradrenaline. The doses of noradrenaline given in the present case were fairly large, but larger doses have been given in similar circumstances by various workers—e.g., Smith and Guz (1953)—without ill effect. Caserta et al. (1956) used mephentermine sulphate, another powerful peripheral vasoconstrictor, but there was a clear interval between stopping the drug and the development of gangrene. Humphreys et al. (1955) described several cases of skin gangrene following noradrenaline therapy, but these all appeared to be due to local leakage of the drug into the tissues. This mechanism was not important in the present case, because the left leg, which received no infusion, became gangrenous like the other limbs.

I must thank Dr. R. R. Bomford and Prof. D. S. Russell for permission to publish.

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INSTRUMENT TO AID VOICE-TRAINING OF PROFOUNDLY DEAF CHILDREN

G. R. G. PLANT
M.C., M.A. Cantab.

THE wearing of hearing-aids is of great help to partially deaf children, and the introduction of auditory training with powerful group hearing-aids in the children's classrooms has proved to be of benefit to children with very limited hearing; but the deafness of many grade-III pupils at schools for the deaf is so profound that they can derive little benefit from auditory equipment, even of the most powerful kind, and for these children reliance continues to be placed on speech-training methods which accept the fact that they are unable to hear either their own voices or those of their teachers.

In such training a profoundly deaf child can be taught how to coordinate the various parts of his mouth and throat so as to produce the different types of vowel and consonant sounds which make up speech, and in time he will learn how to put the sounds into order to form words and sentences. However, an aspect of speech which he cannot understand is the variation in frequency, or "pitch", that people with normal hearing impart to their voices during conversation. This upward and downward variation in the fundamental frequency of the vocal cords, known as "voice inflexion", is used extensively in ordinary speech to convey intelligibility and meaning; and experiments show that a frequency variation of almost an octave is often used. Because there is no satisfactory way of teaching a profoundly deaf child how to vary the pitch of his voice, everything that he says tends to be delivered on one constant monotone or with faulty

voice inflexions. Thus, however clearly he may have learnt to enunciate his words, ordinary people find his speech peculiar and difficult to understand.

Previous Apparatus

In an endeavour to meet this situation various forms of visual pitch-indicating apparatus have been devised during the past quarter of a century; but, so far as is known, none of the apparatus has yet been considered to be sufficiently simple or robust for it to be manufactured and brought into general use for children at schools for the deaf.

Frahm (1901) described an electromagnetically operated bank of spring reeds for indicating varying frequency.

Hunt (1935) described a direct-reading frequency meter using two thyratrons, and suggested that it would help the deaf.

Walton (1936) described an optical recording and frequency-indicating apparatus for analysing sound-waves, magnetic circuits being used in parallel.

Obata and Kobayashi (1937) described a direct-reading pitch recorder for indicating the fundamental pitch level in music and speech.

Coyne (1938) described a voice-pitch indicator having a series of tuning forks, each operating a lamp.

Sterne and Zimmermann (1939) described a voice-inflexion indicator in which seven lamps were arranged to be lit by thyratrons, the number of lamps alight at any time varying in accordance with the fundamental frequency of the applied wave.

Horvitch (1948) described inflexion apparatus for the speech training of deaf persons, using eight reed filter circuits.

Jones (1956) described a tonometer for linguists and deaf persons, using a bank of electromagnetically operated spring reeds.

Present Apparatus

Some experiments which I started a few years ago have now led to the development of a new voice-training instrument, whose principal purpose is to demonstrate to a deaf child the pitch of his voice while he is speaking.

The overall size of the first prototype instrument is 9 inches × 9 inches × 14 inches, and it is believed that there will not be any difficulty in manufacturing it. Much assistance has been afforded to me in the final stages of development of the prototype by Miss E. M. Johnson, headmistress of the Old Kent Road School for the Deaf, London, and preliminary trials being conducted at the school with profoundly deaf children are showing considerable promise.

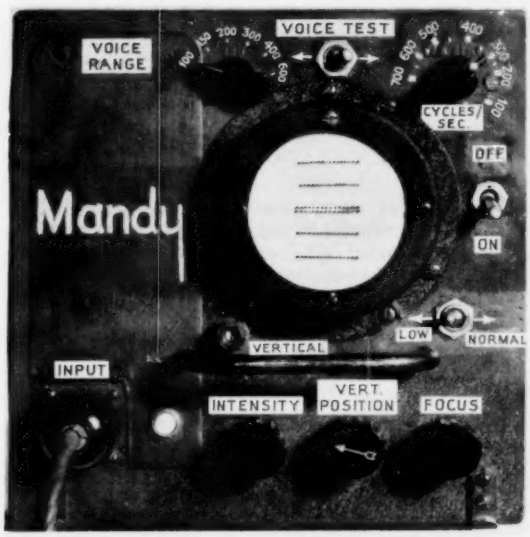

Fig. 1—Front panel of voice trainer.

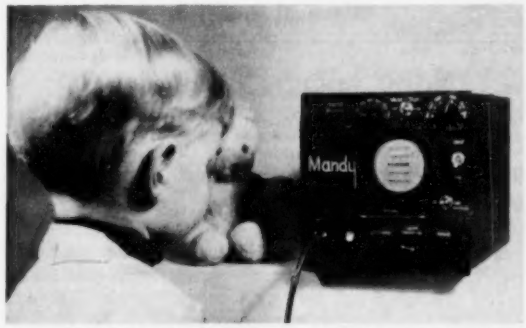

Fig. 2—Child viewing voice trainer: note collar bearing microphone on child's neck.

The front panel of the prototype instrument is shown in fig. 1 and in fig. 2 a child can be seen viewing the screen of the instrument in readiness for a voice-training exercise.

The operation of the instrument is such that the effect of any extraneous noise is suppressed, and the complex sound-wave generated by the child's voice is analysed so that only the fundamental frequency of the vocal cords is presented as a visual signal. The child sees the pitch of his voice as a beam of light moving up and down the screen with the upward and downward variation of frequency, the beam disappearing when there is no vocal-cord vibration. The controls of the instrument are set so that the chosen mean frequency, above and below which the child is to vary his voice, appears on the central horizontal line on the screen, and the trials indicate that the frequency range demonstrated between the highest and lowest lines on the screen should be set at about an octave. In fig. 1 the instrument shows a mean frequency of 300 cycles a second; and in fig. 2 a frequency of 400 cycles a second has caused the beam of light to move up the screen to a position between the two upper lines. The prototype has been designed so that any part of the range of the human voice may be chosen, and it is therefore possible for men and women as well as children with high-pitched voices to use the instrument.

So that the necessary funds may be raised to meet the costs of further tests and development before the final form of the instrument is determined for manufacture, a non-profit-making association, Speech Research for the Deaf, Ltd., has been incorporated, whose registered office is at 116–118, Chancery Lane, London, W.C.2. The instrument is the subject of British patent application no. 5569/57, and all rights for the invention have been assigned to Speech Research for the Deaf, Ltd. Further forms of research will be undertaken as soon as the financial resources of the association reach a point where this is possible.

I wish to thank Dr. T. S. Littler, director, Wernher Research Unit on Deafness, for help and encouragement since the first prototype instrument was demonstrated to him last year.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Tetanus

THE Section of Experimental Medicine and Therapeutics and the Section of Neurology met jointly on May 13 with Prof. J. V. DACIE in the chair.

Prof. G. PAYLING WRIGHT reviewed the use of anti-tetanus serum (A.T.S.) since its discovery by von Behring in 1890. In therapy, the antitoxin was soon found to be disappointing, but its value in prophylaxis was promptly recognised in veterinary surgery. For man, it first showed its value on a mass scale by the striking fall in the incidence of tetanus which followed its general issue as a prophylactic agent among the wounded in the 1914–18 war.

More recent studies on the persistence of injected A.T.S. in children had shown that doses of 100,000 units (as used by Cooke et al. 1943) probably maintained a protective level for six weeks, but the usual prophylactic dose of 1500 units (Bigler and Werner 1941) probably became ineffective after half that time.

The hazards of anaphylactic reactions to a second injection of horse serum were well known, but the danger of "*tetanus post-sérique*", which might result from prior sensitisation to horse-serum antitoxin and its consequent accelerated removal from the blood, was not sufficiently appreciated. In studies on animals, Professor Wormall, of St. Bartholomew's Hospital, had contrasted, with the aid of isotopic labels, the rates of loss of horse-serum gamma-globulin in normal and in previously specifically sensitised rabbits. In the latter, a very large loss occurred even in the first ten minutes: after fifty minutes only about a tenth was still in circulation. Laws and Payling Wright had made similar experiments in 1952, using purified labelled bovine proteins: in the previously immunised animals, little of the protein remained in the blood after twenty-four hours. Laws later showed not only that these proteins were more rapidly removed from circulation but that they were also more quickly destroyed, because labelled polypeptides and other degradation products appeared more promptly in the urine.

A probable instance of a failure of prophylaxis in consequence of previous "immunological education" to horse serum-proteins was the case of "*tetanus post-sérique*" reported by Littlewood, Mant, and Payling Wright in 1954. A 14-year-old boy injured himself with an exploding home-made bomb and was given surgical and antibiotic treatment together with 1500 units of A.T.S. Six months later, he again injured himself through another, almost identical, explosion and again received treatment together with 1500 units of A.T.S. Twelve days later he developed trismus. A trial dose of 0·1 ml. A.T.S. produced a general reaction, but eventually 100,000 units was given. Despite treatment he died seventeen days after the injury. The authors concluded that the prophylactic dose of A.T.S. on the second occasion had been ineffective through its accelerated destruction. They made two important recommendations: first, that once A.T.S. has been given to a patient, he should after a lapse of a few weeks be immunised actively with diphtheria and tetanus toxoid: and second, that before any reconstructive surgery is carried out in a potentially tetanus-spore-infected area, a course of active immunisation should be given.

Dr. D. R. LAURENCE made the point that there was no general agreement on which drug was the most effective anticonvulsant, and this resulted in the polypharmacy with drugs of unknown potency commonly used in treating tetanus. The ideal drug was one which abolished the convulsions but which did not interfere with respiration or seriously impair consciousness. It was justifiable to use animals for testing the effectiveness of drugs because it had been shown that animals and man responded similarly to tetanus. Local hind-limb tetanus was produced in rabbits by the injection of a small quantity of tetanus toxin, and electromyograms were recorded after a standard afferent stimulus in the form of an electrically operated tap to the frame supporting the animal. The electrical responses from the muscles so obtained were electronically integrated and converted to arbitary units which were automatically counted. Using this quantitative response it was possible to obtain accurate comparative bioassays of the anti-tetanus activity of many drugs. It was found that the phenothiazine derivatives were much more potent than mephenesin. Acetylpromazine was by far the most potent drug yet tested and it gave an activity ratio of 10·5, compared with chlorpromazine 1·0, promazine 0·46, and promethazine 0·32.

A Bantu woman with local tetanus in her legs allowed similar studies to be made in a human subject using the stretch reflex as the stimulus. It was shown that chlorpromazine and thiopentone both abolished the tetanus response, but even after thiopentone "emotional conversation" caused a return of the response but "sedative conversation" abolished the response. This emphasised the fact that in the presence of fear and pain higher doses of drugs were needed to control convulsions.

Although chlorpromazine had been used in anæsthetic practice since 1950, its selective anti-tetanic effects had probably been overlooked owing to underdosage and to the fact that it was never used alone. Following the demonstration of its powerful anti-tetanic effect in animals Dr. R. E. Kelly and Dr. Laurence controlled severe tetanus spasms in a boy of $2^1/_2$ years with chlorpromazine alone by using high dosage. Some authors had concluded that chlorpromazine was not of value because they used insufficient dosage. Chlorpromazine was superior to and more convenient than mephenesin, but it was more toxic; and if doses were given too close together (more often than about every two hours) the effect of the drug was lost (tachyphylaxis).

Treatment of tetanus had so far been mostly unscientific. Much could be learnt from animal experiments, but final assessment of a drug must be made by carefully designed clinical trials. In no other way was it possible to measure whether one treatment was superior to another.

Prof. E. B. ADAMS summarised the results of the clinical trials which he and his colleagues had been carrying out at the King Edward VIII Hospital, Durban. Over 200 cases of tetanus in Africans and Indians had been seen in the past two years, and 171 had been included in two clinical trials. In the first trial chlorpromazine was compared with barbiturates and in the second trial chlorpromazine was compared with a mixture of chlorpromazine and barbiturates. No statistically significant difference was found between the results from the various

treatments. The mixture of chlorpromazine and barbiturates was easiest to handle and controlled convulsions well. Lack of control was seldom a problem and death in convulsions was rare, but yet the patients died. Necropsy seldom gave information, and pneumonia was not as common as might have been expected. Intoxication of the medullary centres was very probably responsible. When the period of onset was less than forty-eight hours the prognosis was bad, and this period was of more value than the length of the incubation period. A caution against overtreatment of the mild or moderate cases was given, as they very rarely die and suffer a greater hazard from overtreatment.

Dr. HUGH GARLAND described the Leeds tetanus unit, which served a population of 3 million and had treated 18 cases of tetanus in the past three years. Dr. J. J. L. ABLETT, anæsthetist to the Leeds unit, said that of the last 8 patients treated with positive-pressure respiration 3 had died. He believed that tetanus "need not kill". They had had deaths from agranulocytosis, pulmonary embolism, and hæmorrhage. Treatment with complete paralysis had lasted up to twenty-six days, with an average of two to three weeks. Carbon-dioxide narcosis was an important hazard. Dr. W. RITCHIE RUSSELL advocated tracheotomy even in cases of moderate severity, because the results were so good.

Answering a question, Professor PAYLING WRIGHT deplored the withdrawal of tetanus toxoid as a prophylactic agent in child-welfare clinics. In the discussion, Professor ADAMS said that if patients were kept alive for twenty-six days a 100% survival-rate was possible.

Dr. A. CRAMPTON SMITH described the results of treating 7 cases of tetanus with complete paralysis. 3 patients died, but this did not necessarily reflect the true mortality since the series was too small. Mortality-rates in other series suggested that the overall mortality-rate from tetanus had declined in the past fifty years probably because of better nursing and general care; but severe grades of tetanus still had very high mortality-rates. Curare had been used in the treatment of tetanus since 1860, but it was not until the poliomyelitis epidemic in Copenhagen in 1952 that it was found practicable to treat completely paralysed patients with continuous artificial respiration through a cuffed tube in the trachea. The Danish workers first treated a case of tetanus by complete paralysis in 1953. At Oxford the patient with tetanus was first anæsthetised, then paralysed; an endotracheal tube was passed and respiration continued manually until the patient reached hospital, where a tracheotomy was done and a machine continued the respiration. Difficulties arose because the patient could not breathe for himself, eat, or communicate. He must receive continuous artificial respiration, be fed and turned, and his bronchi must be aspirated. Electrolyte balance must also be controlled. Every time he moved, a nurse gave an intramuscular injection of curare and hyaluronidase. Considerable numbers of patients with various paralytic diseases had been treated in this way, including 32 cases of poliomyelitis with 7 deaths. This treatment was expensive, and required large numbers of nurses. It had been demonstrated, however, that patients with tetanus could be transported to a centre where they could receive the treatment that seemed to offer the best chance of survival. Dr. Crampton Smith suggested that this problem should be considered at a national level.

Reviews of Books

Homosexuality

Its Nature, Causation, and Treatment. CLIFFORD ALLEN, M.D., M.R.C.P., D.P.M., consultant psychiatrist, Dreadnought Seamen's Hospital, Greenwich. London: Staples Press. 1958. Pp. 143. 15*s*.

Live and Let Live

The Moral of the Wolfenden Report. EUSTACE CHESSER, L.R.C.P.E. London: Heinemann. 1958. Pp. 126. 8*s*. 6*d*.

THE slow progress in disentangling the muddle of laws concerning sexual behaviour is discouraging. Now that the Government are hesitating to implement the recommendations of the Wolfenden Committee, on the ground that they have no assurance of popular support for reform, it is to be expected that advocates will resort to the time-honoured practice of pamphleteering. It does not detract from the high intentions and serious purpose of the authors of these books to consider their works mainly from the point of view of what they set out to do; and this seems to be to influence the public to move in the general direction advocated by the majority of the Wolfenden Committee. These books share the good qualities of being well informed; interesting to read; persuasive without being irritating; and warmly partisan, but not to the point of insobriety. They also share a common defect—each would have been very much more effective as two books.

Dr. Allen's difficulty is that he attempts, mainly by the use of case-studies, to encourage psychiatrists to take a more hopeful view of therapy and to convince patients that their condition can be alleviated. These two goals are hard to attain in a single attempt, and the reader's sense of direction may be further confused because the book's aims are not explained until the final paragraph. The homosexual patient emerges from the text as an unfortunate figure deserving at least a helpful approach by doctors, which, as many homosexuals know to their cost, is not always forthcoming. Dr. Allen raises the important question why homosexuals do not follow the much easier path of normal sexual behaviour but, instead, take a road which leads them into such terrible social, personal, and moral difficulties. He attempts to show where the reasons may be sought, and his findings may bring hope to many sufferers.

It seems a pity that the epidemiology of this condition is not examined more fully. Why, for example, has Dr. Allen included only 2 women among his 21 cases; and why does he appear to be thinking almost always of men and hardly ever of women? Both these questions illustrate phenomena of considerable importance and deserve fuller examination. The book is not entirely free from some rather out-dated analytical modes of thought, manifest in a tendency to offer a stock explanation of common individual propensities. For example, it is twice stated that the toddler child's dislike of rice pudding is related to his deprivation at the time of weaning. The ordinary reader may well wonder about the author's knowledge of children because, since this oversimplification was first stated, there has grown up a generation of toddlers who know not rice pudding (because of the war) and who have been brought up by mothers with less restrictive notions both about nursery puddings and about insisting on their consumption. The result of a nursery Gallup poll about rice puddings might show a majority in favour!

The difficulty in *Live and Let Live* is that Dr. Chesser follows the lead of the Wolfenden Committee and attempts to deal with both homosexuality and prostitution at the same time. The committee succeeded in keeping the two issues separate, but the same has not been true of the emotional and confused public discussions that have followed. In taking both subjects together, Dr. Chesser will scarcely add to clarity of thinking, because the "feeling tone" of homosexuality is so much stronger than that of prostitution; and this difference may make the second half of the book appear flat and forced compared with the first.

Since his aim is to mould popular opinion and mobilise it in a "more rational" discussion of these problems, it is a pity

that he does not consider more fully the significance of the enormous difference to be found, for example, in the strength of feeling shown by ordinary people towards male as compared with female homosexuality; and homosexuality as compared with female prostitution. More understanding of these phenomena might make possible the more rational discussion that Dr. Chesser and others so earnestly desire.

The final sections of both of these books are devoted to constructive reviews of the Wolfenden Committee's proposals in relation to existing law, and they should do something to help secure the public acceptance of that mainly wise and humane report.

Florence Nightingale and the Doctors

SIR ZACHARY COPE, F.R.C.S. London: Museum Press. 1958. Pp. 163. 21*s*.

Miss Nightingale was a woman of complex character, who has been pictured in different ways by the several authors who have studied her. Sir Zachary's book concerns one aspect of her life—her relationship with the medical profession. He has examined it through the medium of her correspondence, diaries, and notebooks. This material is voluminous (150 volumes are preserved in the British Museum collection alone), and much in the book has not previously been published. Nevertheless, it must be an incomplete record of her activities, of which the most important part was often personal and confidential interviews of which no record survives.

Miss Nightingale wrote to, or about, a large number of doctors—eminent and obscure, orthodox and "quack," British and foreign. Some of her letters are to international figures, such as Sir James Simpson and Dr. John Shaw Billings; others discuss a friend's choice of a family physician. Two figures illustrate how her attitude to doctors depended largely on the man. Dr. John Sutherland, who was the chief medical member of the Government commission sent out to examine conditions in the Crimea, met Florence Nightingale there; and remained her staunch ally for 36 years. Their joint efforts completely reformed the Army's standards of housing and sanitation. They were the closest of friends—though Miss Nightingale did not scruple to write to him in severe terms if his opinions differed from her own. Or to describe him as "a man without a soul" a few years before he died with, it might almost be said, her name upon his lips. Very different was her attitude to Sir John Hall, the Inspector-General of Army hospitals. Miss Nightingale attributed (perhaps unfairly) most of the evils she found in the Scutari hospitals to "his incredible apathy." And, as her notes of an interview with Lord Panmure prove, she was instrumental in curtailing his military career.

To what qualities did Florence Nightingale owe her success? In an age when her sisters were striving for emancipation by emulating masculine activities, she achieved more than any of them. She did so by using, to the fullest advantage, very feminine methods. She was at pains to develop a warm friendship with many men in positions of high authority. Once secure in their esteem, she seems to have used the threat of her displeasure to achieve the ends she sought; yet she was prepared to stay in the background and let the men retain the place of prominence. She seldom attended meetings, or swayed large crowds; but she carried her points in private interviews, to which busy and influential personages were constrained to come by Miss Nightingale's rather dubious invalidity. She was endowed with a shrewd intelligence, an uncanny gift for accurate and detailed observation, a clear grasp of the significance of statistics, and a tireless energy. She was not, however, infallible; and to the end of her days she discounted all evidence which supported the theory of bacterial infection. But, whatever her faults, the reorganisation of the Army Medical Services, the redesigning of scores of hospitals, and the introduction of an entirely new idea of sick nursing are lasting proofs of her greatness.

Speaking of previous books about Florence Nightingale, Sir Zachary remarks that "few famous persons have been more fortunate in their biographers". That good fortune continues, and Sir Zachary is to be congratulated upon a painstaking research that has cast fresh light upon the character of a fascinating woman.

The Human Ear Canal

ELDON T. PERRY, M.D., instructor in dermatology, Wayne State University. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957. Pp. 116. 36*s*.

THIS very good monograph—mainly about external otitis—is well printed and excellently illustrated. The overwhelming impression it gives is that the human ear canal is a skin-lined cul-de-sac and that any inflammation of the canal is, therefore, an inflammation of skin—a fact that still needs wider recognition. Dr. Perry warns against the local use of antibiotics in most cases of external otitis, and he emphasises the error of regarding this condition as a single clinical entity; for the external auditory canal is subject to almost as many diseases as skin elsewhere, and each requires its own treatment.

Few dermatologists or otologists will feel inclined to spend so much on a book that can be read carefully and comfortably in a single evening; but it should form a useful reference book in medical libraries.

Surgery of Head and Neck Tumors

HAYES MARTIN, M.D., associate professor of clinical surgery, Cornell University Medical College. London: Cassell. 1958. Pp. 430. 137*s*. 6*d*.

THE first 100 pages are devoted to such general considerations as preoperative and postoperative management, complications, and disabilities after operation, and there is a useful chapter on the risk of and the disability that follows the sacrifice of important anatomical structures. After this, Dr. Martin's book is essentially concerned with operative techniques—imparted more by illustration than by text. His book is therefore profusely illustrated, and some of the drawings are good. It is less his intention to discuss the pros and cons of the procedures than to describe them: nor does he attempt to assess the relative merits of surgery and radiotherapy, either as an adjunct or as elective treatment. The value of the book lies in its statement of the methods now in use at the Memorial Hospital, New York.

Industrial Toxicology (2nd ed. Baltimore: William Wilkins. London: Baillière, Tindall, & Cox. 1957. Pp. 376. $10.).—The second edition of Mr. L. T. Fairhall's book will be welcomed by many who are concerned with industrial medicine. It has two parts, one on inorganic and one on organic substances. In each part the toxic agents are discussed in alphabetical order; there are brief notes on the chemical and physical properties of each compound, followed by information on their industrial uses, toxicity, and methods for analysis, and a list of relevant references. There are new chapters in which recent information on both pharmacology and toxicology has been incorporated. The index is excellent. There are one or two obvious omissions—for example, in the section dealing with cadmium, chronic poisoning is barely mentioned. In general, however, the standard is high, and the book's usefulness is unquestionable.

An Introduction to Pharmacology and Therapeutics (9th ed. London: Oxford University Press. 1958. Pp. 327. 18*s*.).—Prof. J. A. Gunn, with the assistance of Dr. J. D. P. Graham, has produced a new edition of his popular introduction to pharmacology. It has been extensively revised and brought up to date, but with no great increase in length. There is very little to criticise, but in the chapter on drugs affecting cardiac muscle quinidine receives rather scant attention, no mention being made of its important use in ventricular arrythmias; and procainamide is omitted altogether. The book provides a sound, orthodox, and clear account of the actions of the more important drugs, and their uses, and it will be particularly useful to the student revising for examinations.

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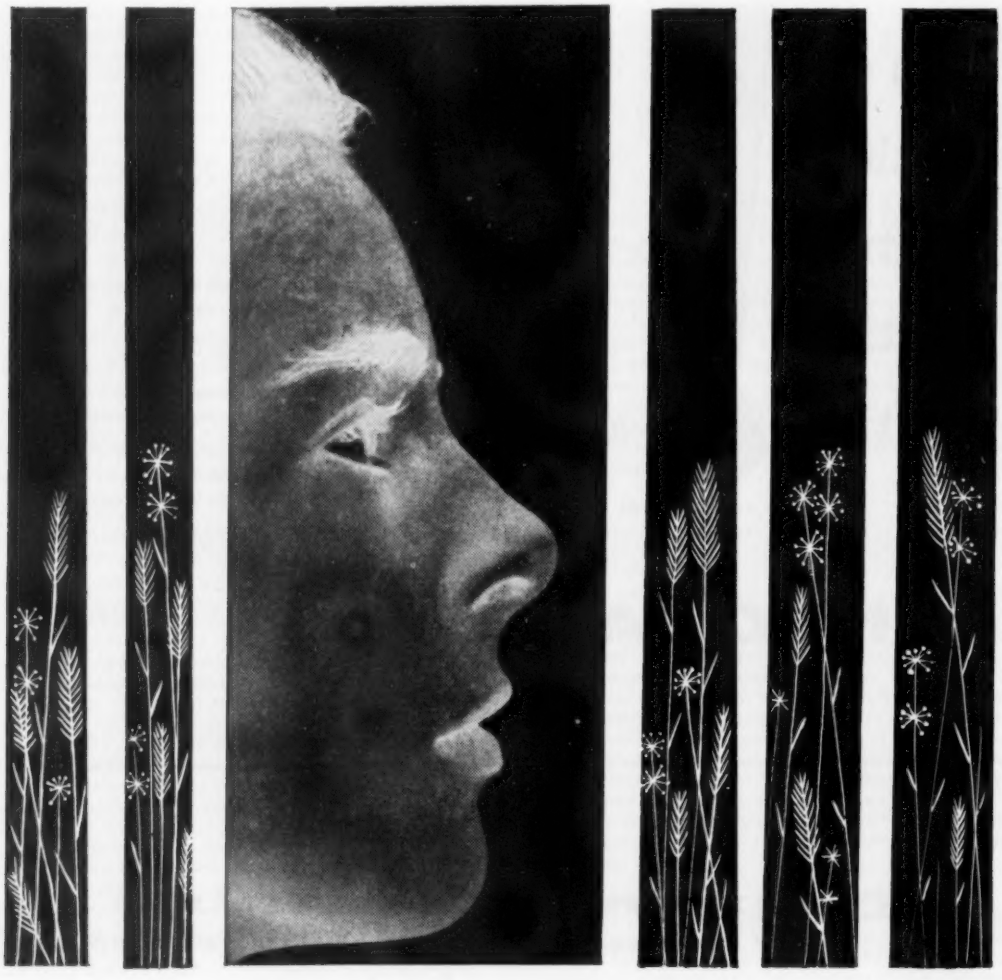

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LONDON 24 MAY 1958

Malignant Hypertension

THE discovery of ganglion-blocking and other potent hypotensive drugs has awakened hopes that with early diagnosis something might be done to check the fatal course of malignant hypertension. The physician assessing the value of such drugs should know as much as possible about what happens to the untreated patient. A yardstick of this kind has long been overdue, and accordingly a review by KINCAID-SMITH, MCMICHAEL, and MURPHY,[1] based on 197 cases of untreated malignant hypertension observed at Hammersmith Hospital in 1935–55, is particularly welcome. In a disease which, left to itself, kills 55% of patients within two months of diagnosis and 90% within a year, the importance of premonitory symptoms cannot be overestimated; and the finding that, as the malignant phase approaches, headache becomes increasingly severe and common should be carefully heeded.

The difference between the benign and malignant phases of hypertensive disease is now regarded by many as one of degree; but opinion has never been entirely unanimous. This question hinges on the pathogenesis of the essential lesions of the malignant phase—namely, focal fibrinoid necrosis of terminal arteries and proliferative endarteritis of slightly larger vessels. When GOLDBLATT's work opened up hypertension to experimental study it was soon found that these lesions did not occur in the kidney distal to the clamp on the renal artery.[2 3] From this it was concluded that the lesions could not be caused by a circulating toxin, nor by simple ischæmia, nor by simple vasoconstriction due to a circulating pressor substance, but must in some way be related to the increased intra-arterial tension. It seemed that the determining factor was a sudden strain imposed on the vessel wall by a combination of severe vasoconstriction and the accompanying rapid rise in blood-pressure. This simple concept has stood up fairly well to the test of subsequent clinical experience and experiment. Lesions have been shown to follow sudden distension of the arterial tree, in animals by intravenous injection of saline,[4 5] and in man by operative relief of coarctation of the aorta.[6] Necrosis has also been observed in the pulmonary arteries in mitral stenosis.[7]

By means of cranial windows the process has been followed in some detail in the brain of the hypertensive rat, and shown to be closely related to intense arterial contraction which disappears rapidly if the hypertension is abolished.[8] The dramatic effect of lowering the blood-pressure has also been demonstrated in man.[9] In their own material the Hammersmith workers find further corroborative evidence in the absence of arterial lesions from areas of kidney supplied by narrowed atheromatous arteries, and they do not dispute that the evidence shows that excessive intra-arterial tension can cause arterial necrosis. Nevertheless they are unwilling to accept the conclusion that the arterial lesions in malignant hypertension are simple results of mechanical strain, and they seem to incline to a dual hypothesis according to which some toxic or even allergic injury, in addition to high blood-pressure, leads to " exudative angiitis ".

A dual hypothesis of this kind of course implies that malignant hypertension must be regarded, not simply as a grade of severity which may develop in any sort of hypertensive disease, but as something differing in kind from the benign form, much more obscure and disturbingly akin to the primary nephritis with which it was so long confused. In malignant hypertension fibrinoid necrosis can be found in afferent glomerular arterioles distal to interlobular arteries which are greatly narrowed by proliferative endarteritis. The Hammersmith workers argue that hypertension can hardly be responsible for the former lesion, because the narrowing, like an arterial clamp, should act as a barrier. But this assumes that the lesion in the interlobular artery precedes that in the afferent glomerular vessel. There is in fact no evidence that it does. It is more likely that the two lesions are responses to a simultaneous insult. Similar narrowing of the lumen of interlobular arteries by simple or fibrinous exudate is commonly observed both in man [10] and experimentally, and endothelial proliferation is probably a stage in the repair of this exudative lesion. There is no evidence to show how long fibrinoid necrosis in the more distal vessels can persist before repair occurs. KINCAID-SMITH et al. find that, although the arterial pressure tends to be very high in the malignant phase, there are exceptions and the pressure is not impressively higher than in a control series of patients with benign hypertension. In fact the mean difference in pressure in 25 matched pairs of patients with benign and malignant hypertension was no greater than 12 mm. Hg. But the control group was drawn from patients with retinitis, in whom, clinically and post mortem, there was no evidence of malignant hypertension. Benign hypertension, on the estimate of the Hammersmith group, is about a hundred times as common as the malignant form, and it may be argued that the minority of patients with benign hypertension who come to post-mortem in a teaching hospital is, statistically speaking, a selected group which may include an undue proportion of severe cases. The mean blood-pressure in this

1. Kincaid-Smith, P., McMichael, J., Murphy, E. A. *Quart. J. Med.* 1958, **27**, 117.
2. Wilson, C., Pickering, G. W. *Clin. Sci.* 1938, **3**, 343.
3. Wilson, C., Byrom, F. B. *Lancet*, 1939, i, 136.
4. Byrom, F. B., Dodson, L. F. *J. Path. Bact.* 1948, **60**, 357.
5. Masson, G. M. C., Corcoran, A. C., Page, I. H. *Circulation*, 1951, **4**, 467 (proc).
6. Benson, W. R., Sealy, W. C. *Lab. Invest.* 1956, **5**, 360.
7. Hicks, J. D. *J. Path. Bact.* 1953, **65**, 333.
8. Byrom, F. B. *Lancet*, 1954, ii, 201.
9. Pickering, G. W., Wright, A. D., Heptinstall, R. H. *ibid.* 1952, ii, 952.
10. Ellis, A. *ibid.* 1938, i, 977.

group was 213 mm. Hg systolic and 122 mm. Hg diastolic.

The fact that in some patients very high blood-pressure may persist indefinitely without causing serious symptoms, while in others malignant symptoms appear before the pressure has risen to particularly high levels, does not invalidate the general proposition that malignancy is essentially an expression of severity. In assessing severity in hypertensive disease it is necessary to consider not only the level of blood-pressure but also the intensity and nature of the underlying vasoconstriction.[3 8] The available evidence suggests that the individual lesion in malignant hypertension owes its origin to a demonstrable functional abnormality which develops quite suddenly in overstimulated, overstretched arteriolar muscle; and if this essentially local disturbance is widespread or persistent enough the disease enters the malignant phase. The fact that such a transformation is rare is perhaps remarkable, but no more so than the adaptability of arterioles in benign hypertension. The simple physical concept of malignancy must of course remain tentative as long as so little is known about ætiology. Nevertheless it may be unwise to reject it merely because it is simple, and still less because it is physical. In the last analysis most if not all biological reactions are physical.

Bones, Genes, and Pregnancy

ORTHOPÆDICS, though it has a long history, has been recognised as a surgical specialty only quite lately. In Britain its birth is customarily dated from the work of HUGH OWEN THOMAS, who died as recently as 1891, fifteen years after KOCH's discovery of the cause of tuberculosis, and rather more than fifteen years before vitamin D was heard of. Orthopædics in THOMAS' day was very different from orthopædics now. Rickets was common, and its manifestations produced much of the surgeon's daily work. Tuberculosis and osteomyelitis, not fully understood, wrought dreadful damage in joints and bones. Poliomyelitis, then a mystery, led to contractures and crippling. Injuries, apart from those induced by occupational hazards, were relatively few. Since then orthopædics has seen a succession of dramatic changes. Bone-grafting and bone banks have been established, and new materials introduced for pins, pegs, and prostheses. Pyogenic infections of bones and joints have been trounced by chemotherapy and antibiotics, though it must be admitted that osteomyelitis is in some places staging something of a comeback, having called up its reserve forces of immune organisms. Tuberculosis can now be treated very effectively, and it looks as though the days of poliomyelitis may be numbered. On the other hand, the internal combustion engine has produced an appalling increase in the practice of traumatic surgery, and degenerative arthritis has become a greater problem in an ageing population.

In all this change, one orthopædic responsibility has remained more or less constant. The congenital deformities—club-foot, dislocated hip, and the like—which helped to give the specialty its name are still with us: indeed, they are possibly more common because of the lower infant mortality and the better care of children. Though the more striking genetically induced catastrophes have been documented, the commoner bony deformities need a great deal of further study. But we are nowadays coming to realise that genetics is perhaps only part of the story. By subjecting laboratory animals to stress during pregnancy we can now produce bony defects in the offspring just as surely as Nature can produce them by the union of two ill-suited germ cells. This type of work is still in its infancy, and there is scope for a great deal of further effort.

Last September the Société Internationale de Chirurgie Orthopédique et de Traumatologie, at its meeting in Barcelona, made this statement:

> "In view of the serious problem presented by congenital deformities and the obscurity of their causation, this Congress recommends that its members should take the following action in their respective countries:
>
> 1. To endeavour to establish research units in appropriate centres in collaboration with other interested workers, such as obstetricians, pædiatricians, and embryologists.
>
> 2. To point out to their Governments the social and medical importance of the problem and to seek the financial aid necessary for the prosecution of research.
>
> 3. When and where it seems desirable, to ask for the institution of statutory notification of disorders—rubella and diabetes for example—believed to be important in the ætiology of congenital disorders."

These propositions are in line with the modern idea of a concerted assault on a problem by the adherents of many disciplines—tactics that have already paid in many other medical fields. Our knowledge of the processes involved in skeletal growth have matured very rapidly by following this prescription, and it is to be hoped that a similar result will attend the proposed attack on congenital deformities. GREEN [1] has convincingly argued that more money and effort should be devoted to research in orthopædics; and there can be no doubt of the importance of this particular cause.

Radioactivity and Public Health

Too often the subject of atomics is treated with the reverence accorded to a mystical cult, with the furtiveness appropriate to industrial restrictive practices, or with the secrecy which national security may or may not require. Yet what we are witnessing is perhaps the greatest ecological change since the recession of the polar icecap at the end of the last Ice Age. Even the small amount of research already done has demonstrated the selective uptake of radioactive isotopes by certain aquatic and terrestrial plants, the varying sensitivity of different forms of life to increasing radiations, the biological concentration of some isotopes in the tissues of the animal body, and their effect on genetic mutations. We are standing on yet another fringe of the unknown, not as Man alone, but with the whole range of living things grouped around us in a symbolic question-

1. Green, W. T. *J. Bone Jt Surg.* 1957, **39A**, 675.

mark. It is against this enormous background that we have to examine our more local problems of radioactivity.

The decision of the Liverpool City Council to buy apparatus for measuring radioactivity in their water-supplies not only illustrates the movement of local authorities into this new territory but also raises wide issues—what and why and when and how and where and who? In Liverpool the city council are cautious in feeling their way into atomics; but they think that the time has now come to build up a mosaic picture of radioactivity as it may affect their population—to establish their datum line of background radiation levels; to watch for the changes and record the facts; and to check the food that the people of Merseyside eat, the air they breathe, the water they drink. That project will carry their investigations far afield, for their present water-supplies come from Wales and Lancashire, and their future schemes include using the River Dee as an aqueduct, with all the extra possibilities of radioactive industrial effluents. There is, of course, nothing novel about far-flung interests: Manchester keep check on their Lake District reservoirs at Thirlmere and Haweswater, and other large water undertakers take the same precautions. There is nothing novel about abstracting water below the outfalls of potentially radioactive waste: much of London's drinking-water is taken out of the Thames below the outfalls of the Harwell, Aldermaston, and Amersham atomic establishments. The novelty lies in the growing emphasis on the need for independent control, and the need to come to terms with changing ways of life.

In the matter of ways and means, it is clear that though some of the larger municipalities, to discharge their responsibilities, may create comprehensive radiochemical and radiobiological laboratories, such action will be far beyond the resources of the majority. Probably the time is not far distant when all public-health authorities will be expected to maintain routine monitoring in their districts; but qualitative analyses are not so easy, and interpretation of the factual data can be harder still. Perhaps the larger municipalities will extend their facilities to their neighbours, both for the analytical work and for interpretive advice—provided they can attract staff of high enough calibre to hold consultant status. But there are possible alternatives. For example, the public analysts may see in atomics a fresh opportunity for expanding their professional business, particularly in the commercial markets. Specialised agencies for providing radiological protection have already entered hospital and industrial practice, and they seem likely to increase in number and value. The universities, on the other hand, should avoid becoming too far involved in the routine work of the extramural world; and it would not be sensible to look to them to provide the services required.

The United Kingdom Atomic Energy Authority occupy a unique position. They certainly have the equipment, the laboratories, the concentration of knowledge, and the specialist staff required for their own purposes, but just how far they can be expected to offer help outside their perimeter wire is still debatable. They are still hypersensitive about their safety obligations under the Atomic Energy Act; they remain much preoccupied with their own industrial medical service; and they are feeling their way in public relations. Acting on a recommendation by the Fleck Committee, they have now appointed a committee, under Sir DOUGLAS VEALE, to advise them on the training and provision of "health and safety" staff not only for their own purposes "but also to meet the needs of the nation as a whole" (see p. 1137); but it would be unrealistic to expect an adolescent industry to undertake unlimited commitments. Though they have agreed to make their resources available to some of the smaller public-health authorities in the vicinity of reactor establishments, obviously there must be a geographical limit, both for the A.E.A. to foster good personal contacts, and for the public-health authorities to expect the A.E.A. to provide a free monitoring service. Again, while it is reasonable to expect cooperation from the A.E.A. in monitoring their own effluents, and to help in estimation of natural background levels and fallout effects, they could hardly be asked to supervise the radioactive wastes from other industries, hospitals, and laboratories in the area. The public-health authorities will rightly be expected to do what might be called their own dirty work.

The increasing industrial use of radioactive isotopes opens up another possibility for routine supervision. Various Ministries already have monitoring responsibilities under the Atomic Energy Act, and some have appointed a radiochemical inspectorate. Expansion of those departments, with their possible absorption into the Factory Inspectorate, would be one way to provide nation-wide monitoring. But this might well mean that attention was concentrated on the industrial problems of radioactivity, whereas we should be thinking of the total load of radioactivity, from whatever source. If, for this reason, it is accepted that the public-health authorities are the proper bodies to keep a watchful eye on the health and safety of the whole community, might it not be better if the expert help they will need were given by the Public Health Laboratory Service, so long a valuable companion to the medical officer of health in his day-to-day epidemiology? The personal contacts are there, the confidence is there. Opinions differ on the future of the P.H.L.S.[1], but if it is to remain outside the National Health Service it could logically be extended by adding a radiochemical section. Specialist staff could hardly be assigned to every laboratory, but some convenient regional grouping might be possible, as with some other specialised techniques. Quantitative measurements, qualitative analyses, and interpretation could alike be made with a bias towards the practical work of the public-health authorities, whose cooperation would be implied, and whose duty to safeguard the public health in this as in its other aspects would remain as clear as it is strong.

1. *Lancet*, April 26, 1958, p. 909.

Annotations

LIBERTY, EQUALITY, AND HEALTH

OVER the years opposition to health legislation has been steadily weakening and falling back on untenable positions. Its deepest ditch has always been that health measures curtail the freedom of the individual. In an interesting review of the organisation of medical care during the past fifty years Prof. R. M. Titmuss [1] suggests that even this is based on a misconception. The summits of health legislation in these years were of course the Acts of 1911 and 1946, and in his view both of them only substituted one form of collectivism for another and each offered increasing freedom to a growing circle of doctors and patients.

The development of scientific medicine since the beginning of the century, accelerated by two world wars and what Professor Titmuss describes as the scientific discovery of malnutrition in the 1930s, made the reorganisation of medical care inevitable. Advances, which were swift and seldom simple, ranged from new fundamental concepts such as the new ideas of Freud to complicated techniques of the laboratory and operating-theatre, and to potent new drugs. Their complexity made specialism a necessity. Their cost raised problems of distribution that were thrown into sharp relief by new statistical and social methods which showed the inequalities of health among different groups of the population. Emphasis began to shift from the environment to the individual patient, from the public-health officer to the general practitioner, though general practice at the time was in a sorry way. Professor Titmuss estimated that in the days before the panel only 10–20% of the population were able to afford to have a private doctor for the whole family. For the rest of the population there was club practice for the breadwinners. The women, children, and old people had to make do with the outpatient departments of the voluntary hospitals, the poor-law institutions, and the sixpenny doctors. One unhappy result of this sporadic medical care was people's reliance on the " secret remedies " which turned many of them into " permanent medicine swallowers ", a national habit which, as we know to our cost, still persists.

Contract practice, in Professor Titmuss' view, was also one of the chief reasons for the doctors' distrust of lay administrators which was shown in their negotiations with the Government in 1911 and in 1946. Indeed the present structure of the National Health Service, he suggests, owes more to the opinion of doctors than to political and public opinion. As he assesses the situation, in 1945 many of the consultants, foreseeing the coming bankruptcy of the voluntary hospitals, the threat of greater local-government control, and the probable harmful effects for doctors as well as patients of the rise in the private costs of health, shrewdly led the profession into the National Health Service. However that may be, the Act of 1946 extended health enfranchisement to women and children and the middle classes. Professor Titmuss considers that the service would perhaps not have been so comprehensive but for the nation's post-war mood for justice and equality of opportunity. But it was also, in his view, a renewal of the argument for the freedom of doctor and patient. To see it solely as a collectivist device for the benefit of the working-classes is too simple, and he believes that the middle classes have benefited even more, and the doctors most of all.

1. A lecture on health, in a series on Law and Opinion in England in the Twentieth Century, given at the London School of Economics on April 29. The series will be published later under the general editorship of Prof. Morris Ginsberg.

GOING TO HOSPITAL WITH MOTHER

THE children of this country are ill less often than ever before in our history. But for the many who still fall seriously ill what is the best type of care to provide? Wider recognition of the emotional sufferings of little children separated from their mothers has led thoughtful doctors and nurses to promote various reforms. Elective operations can be postponed until a stay in hospital is a less disturbing experience for the child—that is, until he is over the age of 5 or 6. Daily or unlimited visiting is becoming much more common in children's wards. Mothers are now sometimes admitted with their young children; and, finally, more illnesses are being treated in the home.

The first film made by Mr. James Robertson, of the Tavistock Clinic, *A Two-year-old Goes to Hospital*,[1] helped to draw notice to the need for these improvements. This moving picture of a young child's suffering in hospital caused a painful emotional struggle in many people, who had to recognise that their conscientious efforts to help had caused avoidable suffering. When Mr. Robertson's second film, *Going to Hospital with Mother*, was shown to a Press audience a few days ago it was preceded by excerpts from his first film, and the juxtaposition emphasised convincingly the contrast between the emotional states of two young children admitted to hospital for the same operation. For the second film is of a mother and child entering the children's ward of Amersham General Hospital, where nearly half the under-5-year-olds are accompanied by their mothers. Making allowance for differences in temperament, there can be no doubt whatsoever that the little child who had her mother with her overcame a more serious physical reaction to the operation with far less emotional disturbance than the child whose mother could spend only a short time with her each day. Even the most sceptical audience could hardly fail to be impressed by this second film, which is technically of a high order and well constructed to convey its message.

But bringing mother into hospital with the child is not enough in itself. The film makes clear that a big change of attitude is called for—particularly in the nursing staff. In a ward where mothers and children are admitted together those in charge must be able to appreciate the mother's anxiety and to help her with it. Not only has the mother an ill child to worry about, she has had to leave her husband and possibly other children to fend for themselves. She may also have conscious or unconscious anxieties herself about hospitals, and medical or surgical procedures. This maternal anxiety can, and does in certain cases, communicate itself to the child or other mothers. But, provided the mother can be given understanding support, there is no doubt that the child will benefit greatly from her presence and comfort at a difficult time. The mother will, at the same time, gain confidence in her relationship with her child, through encouragement to help him when he is ill and needs her most.

The ward-sister who can find satisfaction in helping mothers to help their children is unfortunately still too rare, though if more doctors were far-seeing enough to give the lead hidden reserves would surely be uncovered. But a wholesale change in the attitude to childhood illness

1. See *Lancet*, 1952, ii, 1122.

could not be achieved without changes in the training of nurses and doctors. It is the nurses who fear most that they will lose their function; yet in fact the way is being opened for them to play a much bigger part in the lives of their patients.

Thinking beyond the lesson of this film, we can recognise that many more young children who are ill could be nursed at home, given adequate special assistance. Most mothers would probably be much less anxious in their own homes, where they can be helped to fulfil their many responsibilities without a conflict of loyalties. Clearly it is least disturbing emotionally for the sick child to have no extraneous difficulties, such as separation from home or mother: illness itself is enough of an anxiety.

Moreover, from the physical viewpoint, hospitals are by no means always the best places in which to be ill at any age. Perhaps Mr. Robertson will make another equally skilful and convincing film called *Being Ill at Home*?

THE ASIAN INFLUENZA EPIDEMIC

LAST week the Section of Epidemiology of the Royal Society of Medicine discussed the recent world-wide epidemic of influenza. Dr. A. M.-M. Payne, of the department of endemo-epidemic diseases of the World Health Organisation, described the surveillance of last year's epidemic, the first widespread epidemic to arise since W.H.O. set up a network of laboratories and listening-posts for an eventuality of this kind. By a curious stroke of fate, however, the epidemic started in Communist China, which is not a member of W.H.O. As a result, two or three valuable months were lost before W.H.O. could give warning that a new influenza virus was about and that it was likely to spread and cause epidemic disease. Within seven months the new virus had spread to almost every country in the world, and in many places attack-rates of 20–40% of the population were reported. Overcrowding had a striking effect in increasing the attack-rate; and almost everywhere it was found that people over 60 were less likely to be attacked than younger people. There has been much speculation whether this sparing of older people might be the result of infection in earlier life with a virus immunologically similar to the present Asian virus[1]; but the feeling of many who took part in last week's discussion was that older people were less exposed to infection.

This point was carefully discussed in a thoughtful paper by Dr. J. C. McDonald, who summarised a series of investigations of the epidemic in this country. There was a striking association between the onset of an epidemic focus and the opening of schools in that area. Schoolchildren then brought the infection home, as was easily shown by study of the onset of primary and subsequent cases in families. There was a lower incidence of influenza in families without schoolchildren, and if families without children were considered alone there was no sparing of older people compared with younger members of the same family. Taken together these findings suggest that older people were spared because they were less exposed to infection. There is growing evidence, however, that although older people were relatively free from influenza during last autumn when the epidemic wave was at its height in this country, infections with the same virus were continuing during the early part of this year. Deaths probably due to influenza showed two peaks, one in the autumn and one in the early part of this year; and, in the second wave particularly, there was a high proportion of deaths in those over 65. The influence of weather and the significance of the sparing of older people during the first wave remain important subjects for investigation.

On the key question, "What will the Asian virus do next winter?" both Dr. Payne and Dr. McDonald thought that after this burst of activity it would now settle down to a normal existence.

1. See *Lancet*, April 19, 1958, p. 833.

SUDDEN BLINDNESS

ONE of the less common emergencies that face the neurosurgeon is sudden visual failure, either in one or, occasionally, in both eyes. The diagnosis between surgically operable and other conditions may not be easy, while it is notorious that tumour within the sella turcica may give rise to a bizarre picture that is usually mistaken for meningitis, subarachnoid hæmorrhage, or sagittal-sinus thrombosis. In a helpful article Uihlein and Weyand [1] analysed the causes of unilateral loss of vision of 310 cases at the Mayo Clinic. Ophthalmological conditions accounted for 50% of the cases, while in 39% there was a lesion involving the retrobulbar portion of the optic nerve. Uihlein [2] reviewed those cases in which there was acute visual failure and found that the non-ophthalmological causes were, in order of frequency, pituitary tumour, glioma of the optic nerve or chiasma, aneurysm, "parasellar lesion", carotid thrombosis, distension of the third ventricle by hydrocephalus, chiasmal arachnoiditis, fracture of the anterior cranial fossa, tumour of the base of the skull, and pseudo-tumour cerebri. The most important of these is the commonest—pituitary tumour. The effects of pituitary tumours include acute complications,[3] of which the most dangerous is "apoplexy of the pituitary gland". In this, Brougham et al.[4] found that extensive necrosis or hæmorrhage in a pituitary adenoma resulted in the sudden onset of drowsiness followed by stupor or coma, severe headache with nuchal rigidity, ocular palsy, and sometimes amblyopia or hemiparesis. The cerebrospinal fluid contained blood or was xanthochromic with an increased number of white blood-cells and commonly an increased amount of protein. Indications of pituitary insufficiency may be the only early feature distinguishing the disorder from acute adrenal insufficiency, a temporal-lobe pressure cone, or the effects of an epileptic convulsion. Even after investigation in hospital, cavernous-sinus thrombosis, meningitis, or subarachnoid hæmorrhage may be reasonable diagnoses. The condition is extremely dangerous, and saving of life is the first consideration. As long as the clinical course moved towards recovery, Brougham et al. pursued conservative treatment. They suggested that with adequate supportive measures some patients might reach a plateau of improvement from which some of them might be rescued. List et al.[5] described three cases of a similar syndrome with a satisfactory outcome. They recommended operation provided there was no hypopituitarism, but if severe panhypopituitarism dominated the picture early surgical treatment was inadvisable. Even diagnostic procedures may lead to sudden peripheral vascular collapse. Investigations should include blood-sugar curves and estimation of electrolytes. A ventriculogram may furnish valuable information.[6]

1. Uihlein, A., Weyand, R. D. *Arch. Ophthal., Chicago*, 1953, **49**, 261.
2. Uihlein, A. *Brit. J. Ophthal.* 1958, **42**, 157.
3. *Lancet*, April 12, 1958, p. 780.
4. Brougham, M., Heusner, A. P., Adams, R. D. *J. Neurosurg.* 1950, **7**, 421.
5. List, C. F., Williams, J. R., Balyeat, G. W. *ibid.* 1952, **9**, 177.
6. Jefferson, G. *Proc. R. Soc. Med.* 1940, **33**, 433.

Discussing the causes of acute visual failure, Uihlein described five cases in which visual improvement followed prompt operation. As long as any vision at all remains, surgery may offer considerable hope of restored vision. Where complete blindness has resulted the prognosis is so much worse, but even then vision may occasionally be restored by prompt intervention. Where blindness is accompanied by acute hypopituitarism the risk must be carefully weighed, and the neurosurgeon's judgment is stretched to its utmost.

ANÆMIA DUE TO ANTICONVULSANT DRUGS

IN 1954 Badenoch [1] demonstrated megaloblastic anæmia in 2 epileptic patients; and Hawkins and Meynell,[2] reporting a similar case, suggested that the phenytoin ('Epanutin') given for treatment to all 3 patients was the cause. Later in 1954 Chalmers and Boheimer [3] described a similar incident in a patient who had had barbiturates and phenytoin for some years but for the previous six months had had primidone ('Mysoline'). Since then several cases have been reported, and isolated reports continue to appear: for example Kidd and Mollin [4] reported a case associated with phenytoin and another with phenytoin and primidone treatment, and Barker [5] and Varadi [6] have lately reported further cases in our columns. Newman and Sumner [7] reported a case associated with primidone but reasonably concluded that megaloblastic anæmia due to anticonvulsants is a rare complication that should not deter physicians from using phenytoin and primidone, now the two most effective anticonvulsant drugs. These reports make it important to find out the true incidence of megaloblastic anæmia in patients with epilepsy receiving anticonvulsants, whether there are any early indications that the drugs are causing interference with hæmopoiesis, whether such signs can be corrected, and, if so, whether this benefits the patient.

To answer such questions, Hawkins and Meynell [8] have carried out a series of investigations in a colony for epileptic and mentally defective patients.

They studied 72 epileptic patients (40 male and 32 female) who were all receiving anticonvulsant drugs—phenobarbitone, phenytoin, and primidone, alone or in combination. For controls they used 30 non-epileptic mental defectives living in the same colony, and 30 healthy persons, mostly medical students and hospital staff. Few patients were actually anæmic, but significant macrocytosis was found. Of the epileptics a third had a mean corpuscular volume (M.C.V.) of 94 c.μ or more; and the mean in all the epileptics was 92·2 c.μ (S.D. = 4·51), whereas in the normal controls the mean was 86·6 c.μ (S.D. = 2·53). In the 30 patients who lived in the same colony but did not have epilepsy the figure was 88·7 c.μ (S.D. = 2·58). All these differences were statistically significant. Further analysis showed that of patients receiving both phenobarbitone and phenytoin, 45% showed macrocytosis of the erythrocytes; in patients on one drug the figure was 34% for phenobarbitone and 27% for phenytoin; 2 out of 3 patients on phenytoin and primidone had macrocytosis, but all 4 on primidone alone were normal. There did not appear to be any significant dietary deficiency among the patients, and there was no evidence of liver disease. The incidence of macrocytosis was unrelated to the number of fits.

There was indeed little doubt that the anticonvulsant-drug therapy was the cause of the macrocytosis. Hawkins and Meynell investigated the serum-vitamin-B_{12} levels in a group of epileptic patients and found normal figures; they took 6 with macrocytosis and gave them 100 μg. vitamin B_{12} subcutaneously weekly for two months, but the macrocytosis remained unaltered. There was therefore no indication of vitamin-B_{12} deficiency. Tests to determine effects of folic-acid absorption or tissue depletion of folic acid were carried out by Girdwood's method [9] and no abnormalities were found. But when 20 mg. of folic acid a day was given orally for a month to 6 patients with macrocytosis, the M.C.V. values fell towards normal in every case.

Actual drug-induced macrocytic anæmia is, as suspected, uncommon. Hawkins and Meynell had been studying 170 epileptic patients over two years and found only 8 cases of macrocytic anæmia among them.

6 of the 8 were being treated with a combination of phenytoin and phenobarbitone, 1 was on phenytoin alone, and 1 on primidone and phenytoin. In 4 the anæmia was severe, with hæmoglobin levels from 22% to 47%, and all these patients had typical megaloblastic marrows; of the others 2 were reported as macronormoblastic and 1 as "hypoplastic", and 1 was not examined.

Their patients were given vitamin B_{12} and, as in other trials, the response was variable; 5 of the 8 patients responded well, but 3 needed folic acid. The anticonvulsant drug was kept on at the same dose except in 1 patient whose phenytoin was stopped and phenobarbitone given instead. Folic acid seems to be the most suitable anti-anæmic drug, and Hawkins and Meynell suggest that a daily dose of 5–10 mg. provides sufficient protection; with this dose there has been no tendency for neurological complications to appear.

Hawkins and Meynell draw attention to the remarkable improvement in the epilepsy when the anæmia was treated, and their case-reports are indeed striking.

For example, a man who had previously had 2–3 attacks of minor epilepsy a month for twenty years had no further attacks after treatment of his anæmia and maintenance on folic acid for three years; and a man aged 21, who had at least 3 major attacks daily, has had a two-year period free from attacks after treatment of his anæmia. On the other hand treatment of the anæmia had no effect on the number of fits in an imbecile epileptic.

Hawkins and Meynell hold that "blocking of vitamin B_{12} and folic acid is an important factor in lowering the threshold for the cerebral discharge producing the epileptic attack". This blocking presumably interferes with the synthesis of ribonucleic acids—and at an early stage in the process, according to current views, since vitamin B_{12} and folic acid can overcome the effect.

From a practical point of view this report shows that it is worth examining at regular intervals the blood of epileptic patients who are receiving regular treatment with anticonvulsant drugs. To detect the toxic effect in its early stage, it is necessary to estimate the mean corpuscular volume. This estimation is carried out in most laboratories by Wintrobe's method, which involves taking a sample of venous blood. Some methods require only finger-prick blood; for example, Shils et al.[10] have described a micromethod using the usual 0·02 ml. "hæmoglobin" pipette, and such a method might be more convenient in an epilepsy colony. If the M.C.V. is high and continues to rise, treatment with folic acid in addition to the anticonvulsant is indicated. Since the epilepsy itself benefits from the correction of the anæmia, regular ordinary blood-counts should also be part of the programme of control.

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Special Articles

EARLY DISORDERS OF THE MOTHER-CHILD RELATIONSHIP *

FREDERICK H. STONE
M.B. Glasg., M.R.C.P., F.R.F.P.S.
CONSULTANT IN CHILD PSYCHIATRY,
THE ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW

THE importance of early childhood experiences in the genesis of psychoneuroses in adult life is widely recognised and indicates where the first steps should be taken to prevent such emotional breakdown. The child-guidance clinics, overworked and understaffed, complain that even their cases often come too late. So we turn to the very earliest years of life and already find, although our clinical experience in " infant psychiatry " is not yet extensive, much to interest those concerned with the health of children.

Normal Mother-child Relationship

The mother-child relationship may be described as the sum total of the thoughts, feelings, attitudes, and resultant behaviour of a mother towards her child.

Where human psychology is concerned, " normal " is almost a forbidden term; yet some attributes of mothering seem to be of its essence, though taken so much for granted that we become aware of them only when absent or distorted. Although most of these are relevant for the whole range of childhood, the emphasis shifts with increasing age.

Firstly, and basically, there is mother-love, to which an essential corollary is the mother's enjoyment of her child. Next there is protectiveness of the child from psychological and physical traumata. Although a mother's mood may fluctuate within fairly wide limits, there should be an underlying consistency of attitude. We do not expect what is forbidden on Monday to be condoned on Tuesday.

A mother's reactions should be appropriate to a given situation, and we are startled when confronted, for example, with real amusement as a response to a child's severe distress. A mother should perceive her child as a separate person; she should not make the child simply an instrument of her own ambitions (Stone 1955).

Disordered Mother-child Relationship

As soon as we attempt clinical description, it is proper to ask what is known of the normal range of interactive behaviour between mother and child. It must be emphasised that this is not the same as the " milestones " of child development. Without in any way disparaging the pioneer observations of Gesell and others in this field, we can say that these workers studied the developing child, as it were under a psychological microscope but to a large extent in vacuo, with little reference to the development of the child's primary interpersonal relationship with its mother.

It takes assiduous practice to be able to observe, let alone record, everyday interaction between mother and child (Escalona 1953) such as confronts us daily in clinic and consulting-room, but which we tend to ignore as irrelevant.

*Based on a lecture given to the Scottish child-health group of the Society of Medical Officers of Health in February, 1957.

DISTURBANCES IN EMOTIONAL CONTACT

Lack of Contact

Mother and child are together yet remain two separate unrelating people. The toddler is exploring the surgery or examining some toys, and the mother is telling her story to the physician, but nothing happens between them. This is quite abnormal, even for a worried mother in a strange setting, because ordinarily the more threatening the environment the more perceptive is a mother of the minimal distress signals emanating from her child. Interruptions and distractions are the rule. The appeals to the mother to " see what I've done ", to " lift me, I'm tired ", to " take me to the bathroom " are often conveyed by minimal cues, even without words; but, just as a mother responds even while asleep to the infant's first whimper, so here the maternal antennæ pick up the distress signals and take appropriate action.

The picture has a different look where a mother and infant are concerned (Levy 1951). Here we are inclined to describe what we see figuratively—e.g., " That woman handles her baby like a parcel ". By this simile we record the absence of a whole range of maternal activities which ordinarily are in action. Even during a consultation the mother will make her infant more comfortable, address it, smile at it, soothe it to sleep, and so forth. In the absence of all this the child seems to have an inanimate quality—" like a parcel ". This impression of " emotional distance " is sometimes strengthened by the mother's avoidance of the use of the child's name or the more common " he " or " she "; instead she may refer to " it ".

Excessive Contact

By contrast we have a situation in which for long stretches of time there is never a break in contact. This is the mother who, even as she is talking to the physician, is all the time touching, caressing, fondling, stroking, or hugging her child, but automatically and not in response to the infant's actions, almost as if the child were a pseudopodium, an extension of her own body (Escalona 1948). Sometimes when one is listening to her story, it is quite difficult to tell whether she is describing the symptoms of the baby or of herself.

DISTURBANCES IN PROTECTIVE FUNCTIONING

Excessive Maternal Anxiety

This mother is convinced that there is something wrong with her infant and, despite repeated negative clinical findings and abundant reassurance, persists in her belief. Her complaints tend to be vague or subjective; her infant may be thriving, but her intense anxiety is real enough, and in search of help she migrates from family doctor to health visitor to pædiatrician and back again.

This is not just an anxiety state in a woman who happens to be a mother, for her anxiety is focused exclusively on her child. It should be remembered that maternal anxiety is a normal component of the protective function and only when it becomes inappropriate in degree or context should it be regarded as pathological. The assessment of this situation calls for the keenest clinical acumen, and most of us have encountered just such a case where a mother's intuition in the end proved superior to expert opinion.

In reaching a decision one must balance carefully the data provided by sensitive history-taking, an assessment

of the mother's personality, and a careful physical examination of the child. Once again the disorder can often be diagnosed by observing the mother's handling of the child. We may describe this as follows: " You would think her baby is made of porcelain ", or " She holds it like a fragile doll ", as if it might break in her hands. This behaviour persists, unlike the uncertain tentative handling by the mother of her firstborn. When the child grows a little older, we begin to see the widely recognised picture of maternal overprotection, where the mother anticipates every possible and impossible danger, is oversolicitous about the child's health, tends to overfeed, and so on.

Lack of Protective Functioning

It is rare to witness this deficiency in crude form, but at times one encounters a child who is constantly exposed to physical dangers—fire, open windows, traffic, and so forth. A less obvious variant of unprotectiveness, however, is not so rare: failure to protect the child from its own overwhelming emotions—e.g., the mother who allows mounting rage to proceed to a stage of panic, who demands standards of performance well beyond the child's maturity, who uses terrifying threats and warnings or exposes the child to scenes of violence.

During a consultation a mother observed in the presence of her 6-year-old son: " Of course he's an adopted child "; and in response to my query she answered: " Oh no, he doesn't know anything about it ". This, by the way, was not a stupid woman. Indeed, I have found little evidence to suggest that the mother's level of intelligence is a significant factor.

Sometimes a mother makes almost adult demands of her baby: " I have always laid great store by encouraging the child's independence. In fact I have always trained her to make her own decisions. As soon as she could talk, at 15 months, I would make her decide at breakfast whether she wanted her egg boiled or poached."

Another striking instance of disordered protective functioning was the mother whose 2-year-old daughter was so pale (largely because of a feeding problem) that the mother always put rouge on the child's cheeks before taking her out for a walk.

Reactions of the Child

Sometimes the child does not seem to react to these disorders in relationship. For example, in routine baby or toddler clinic examinations our own observations of maternal attitude and handling may strongly suggest that all is not well, yet the mother has no complaints, and the child is in excellent health and spirits. Later we may find that another child in the same family and under very similar conditions is far from well. It should not surprise us too much that infants are born with different degrees of sensitivity to emotional stimuli, the occasional child reacting violently to minimal stresses. Glover (1953) has rightly made a plea for careful follow-up studies of these infants, postulating that these behaviour patterns may be the very first hints of psychological instability.

In other cases where there is clear evidence of disordered mother-child relationship the child's " symptoms " may be entirely subjective, at any rate at first, but sooner or later the baby tends to show disorders of crying, of sleeping, of feeding, and of bowel function, alone or combined. The child may cry all the time or not at all, refuse to sleep or sleep excessively, show no interest in food, vomit or ruminate, or have bouts of diarrhœa. Where an allergic diathesis is present, the response may take the form of infantile eczema or " wheezy bronchitis ". There is great difficulty in diagnosis here in that these symptoms may also present in a large range of medical and surgical diseases of infancy. The attempt, however, should always be made to diagnose a disordered mother-child relationship by recognising its positive signs and not to infer the diagnosis by failing to detect clinical signs in an infant. The presence of such signs may not be the cause of the symptom in question; their absence may only mean that the lesion is clinically undetectable. At a slightly older age other responses appear—e.g., temper tantrums, breath-holding attacks, withholding of fæces, and excessive and persistent fears.

Technique of Interview

At least half an hour is required, and for the physician recording both the spoken word and behaviour it is a busy half-hour. Minimal direction is given because so often the apparently irrelevant may be highly significant. Moreover—and how many of us are ever taught this as students?—obvious omissions, evasions, and contradictions should be recorded. If in history-taking one is repeatedly frustrated in trying to obtain consistent information about one particular topic—e.g., the pregnancy or the feeding situation—it will afford little to press harder for an answer, and nothing at all if the questioner is by now exasperated. Of course, a certain degree of orderliness is essential in the gathering of a history, but this is not in any way incompatible with a non-directive technique.

Essential in the interviewer is a sympathetic attentive listening attitude. There is here a special difficulty for the contemporary physician. All his training from undergraduate years onward has groomed him for a role of action. He is expected to make decisions, to advise, to prescribe. Now, disconcertingly, he is required to adopt an essentially passive role. In the face, perhaps, of a singularly unmanageable child and completely ineffectual mother he must remain not only a passive observer but also a relaxed one. Some can never hope to achieve this, but for the majority the most effective aid is determined concentration on the task of recording what is happening. The physician must listen sympathetically without judging, criticising, advising, or becoming emotional himself, but giving his full attention. Even a very little proficiency in the technique of the psychotherapist (for that is what is being described) will expose the interviewer to an even trickier hazard—the attitude of the parent towards him.

The physician may be surprised to discover that the adoption of these few modifications in interviewing technique often produces a rather startling response, and by no means invariably a friendly one. Whether the parent's response is one of dependency, gratitude, hostility, or rivalry, it will almost invariably appear so exaggerated in intensity as to seem inappropriate to the clinical situation. An explanation of these transference phenomena is not within the scope of this paper, but their understanding is important and can be achieved only by discussion of the cases with a trained psychotherapist. And still the physician must remain interested, sympathetic, and undismayed.

A first interview emotionally charged in this way should invariably end with the offer of a second appointment, which may develop into a series of interviews. To the distraught parents this is the concrete evidence that

here is a doctor who accepts them, " badness and all ". A first interview held jointly with both parents and child is of such rich potential that it is surprising how methodically many child-guidance clinics eschew its use. It must be very seldom indeed that a child hears in a consultation anything said about itself which is half as frightening as it has already constructed in its own imagination.

Ætiology

There can be little doubt that events in pregnancy can contribute to later distortions of the mother-child relationship (Caplan 1951). We are all aware of superstitions and old wives' tales connected with pregnancy, and any one of these is a potential source of danger to an expectant mother. Curiously, these appear to operate universally, irrespective of intelligence, education, or social class. Each culture has its own favoured beliefs, but none is free. I do not suggest that, because an expectant mother has had mixed feelings about a pregnancy or has worried a great deal about some thought or action, a disturbed mother-child relationship must inevitably follow. This happens only when the event becomes coloured with guilt. It is almost certainly true that the core of the disturbance really belongs to a much earlier point in the mother's emotional development, and that this is " triggered off " by a psychic event during the pregnancy.

A boy, aged 2½, had violent temper outbursts on the mildest provocation. As a baby he cried all the time, and brought up his bottles. His brother, ten months older, was well. The mother spontaneously described the circumstances of her father's death which occurred during the early months of the pregnancy. He was in hospital and she was asked to take him to her home. Instead, she persuaded another relative to do this, did not tell the truth about his condition, and he died within a week. The baby was unwanted, and she tried to prevail on her doctor to bring about an abortion. From the start this mother saw the child as a " monster " who would grow up to revenge himself on her for her death wishes against him. He cried almost continually throughout his infancy and she has described how she would hurl him into the bed screaming that he should never have been born. The battle between mother and child had raged for practically the whole of his short life. What we observe here is an event in pregnancy leading to a distortion in the mother's perception of her infant son. It is understandable that she could be neither loving nor protective towards an avenging monster. The improvement in the mother-child relationship and in the behaviour problem during the ten weeks' treatment was quite dramatic. It was remarkable to contrast the original picture with the affectionate competent mother of a few weeks later.

Yet another crucial epoch is the time of the delivery. Of the greatest importance here is the reaction of the mother's near relations, especially of her own mother, and of her husband. The fact that at this stage the father's role vis-à-vis the child is indirect does not mean that it is unimportant. In many eastern countries the birth of a daughter is still regarded as something of a tragedy, and husband and relations may make no secret of their disappointment. Such crudity is not part of our western culture, but that is not to say that we have not our own pitfalls. In some respects our highly organised obstetric routines may contribute to maternal anxiety.

A mother may by chance be kept waiting a considerable time after delivery before having the infant brought to her. There can hardly be a woman who, in these circumstances, does not rapidly become convinced that something is amiss with the child. As she lies in anxious dread, self-accusation begins, and all the trivia of pregnancy assume immense proportions. Both rational and irrational factors may play their part. In recalling the events connected with a child's birth it is remarkable how often these mothers describe the midwife or the ward sister as a heartless tyrannical figure against whom the strongest feelings of fear and hate were harboured. It is clear that in the great majority of instances there is no substance in these assertions, and that the conviction with which they are held is clear evidence of neurotic distortion. The failure of doctors and nurses to understand this sort of mechanism can cause them to contribute unwittingly to these irrational attitudes, and this may have repercussions not only on the course of the labour but also on the mother's handling of the child.

In certain circumstances the disturbed relationship is activated by the child.

An infant may be born with a disfiguring congenital abnormality—e.g., hare-lip. It is very rare for the mother outwardly to reject such a child, but it is common for her to make this child the centre of her whole menage, sometimes to the neglect of her family, and, as it grows, to develop a pathologically overprotective attitude. Personality disturbance associated with congenital abnormality is a subject ripe for investigation and may well be preventable in the first weeks or months of the child's life.

Another, though much less obvious, example of the same kind of sequence of events is when the baby is extremely unresponsive. This may happen before it is recognised that the child is mentally retarded, or deaf, or destined to show later the clinical picture of infantile autism (Kanner 1943), in which a striking component is disinterest in all human beings. In instances such as these the mother is often observed later to be " cold " or " detached ", and this is invoked as a causal factor. This may indeed contribute to a cumulative cycle of disharmony but need not have been the starting-point.

Many women can locate precisely a moment at which they suddenly experience the feeling of being a mother—of having a child of their own. This may be during pregnancy or at birth but is often delayed thereafter by hours or days. Possibly, as in " imprinting " in animals (Tinbergen 1953), there are for mother and child critical points at which the relationship " takes ". If so, it is understandable that separation of mother from child just after birth may have deleterious effects.

Under ætiology we must include also the serious psychiatric disorders which may arise at this time—the puerperal psychoses. In this event a healthy relationship with the child is impossible, and there is evidence that buried in every such psychosis lie powerful feelings of hatred towards the infant of which the mother is herself unaware. In other mothers compulsive thoughts of damaging her child may appear in the early months or years of the child's life, but their roots go deep into the mother's own childhood, and other symptoms of the neurosis have probably preceded the pregnancy. Conflicts about femininity which may have remained latent throughout her life may suddenly erupt when she is confronted with the tasks of motherhood, and express themselves as, for example, a profound disgust for breast-feeding. The enthusiastic propagandist would do well in such instances to encourage bottle-feeding with scrupulous avoidance of disparagement.

It will be seen, therefore, that we are at times confronted with psychotic or neurotic illness. However, in many cases of disturbed mother-child relationship the mothers show little or no other evidence of emotional disorder. These respond well and often with surprising rapidity to sympathetic interest combined with a reasonable under-

standing of the type of problem, without necessarily the technical sophistication of the specialist psychotherapist.

Conclusion

Every now and again we encounter a mother who is not prepared to cooperate in the treatment or whose capacity for insight is extremely poor. What is surprising is that this does not happen more often. It is important that those directly concerned with the health of mothers and young children should become practised in the detection of these disorders; this is especially true of family doctors, pædiatricians, physicians, and health visitors in the maternity and child-welfare services. Some will, by aptitude and inclination, wish to undertake the management of the cases themselves and should be encouraged to do so. It must be emphasised, however, that success will not be forthcoming without acquiring the necessary technical competence. This is probably best achieved by regular case conferences under the supervision of a child psychiatrist, who must also be available to take over the occasional case demanding expert intervention.

Only by careful follow-up studies can the long-term effects of this form of treatment be assessed, but there are enough data to make us cautiously optimistic. Already there can be no doubt that this work provides a field for interesting and potentially important research.

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ARTIFICIAL INSEMINATION

By a Practitioner

Amid the emotion, confused thinking, and uninformed opinion that surrounds the subject of artificial insemination by donors, it is perhaps legitimate to inquire why this procedure is ever contemplated and in how many families it is now used.

Setting aside situations in which it would in no circumstances be considered by a doctor, what kinds of case remain as possibly suitable for A.I.D. and why?

The number of couples seeking this method of treatment is small and will always be so. No couple would wish to have a child by artificial means if they could have one naturally. The demand for A.I.D. is also limited by the fact that of the 8–9% of married couples who are subfertile, in only 1 in 10 is the husband irremediably sterile. Fears that A.I.D. might become widespread are therefore groundless. It is, and must remain, a small factor in the treatment of the barren marriage and a still smaller one in human affairs.

It is difficult to estimate accurately the number of children already born as a result of A.I.D. One doctor who has practised it for about sixteen years has produced 69 babies by this means, and the total number of doctors using it at present in this country probably does not exceed ten.

The Parents

The classical cases are those of the married couple in which the husband has been proved to be irremediably sterile; or of the couple who, having suffered one or more rhesus tragedies, greatly desire to rear a family because they regard it as one of the most, if not the most, important objects of marriage.

Such couples may choose A.I.D. rather than adoption because the husband prefers to bring up his wife's child rather than an adopted child propagated by two unknown people, and because the wife has the natural desire of every ordinary woman to produce and cherish an infant of her own.

Such marriages are stable. A.I.D. does not attract the frivolously minded couple who take a light view of marriage. Husband and wife must have agreed together that A.I.D. is the right course for them. Neither must have overridden the scruples of the other. Neither must think it wrong that spermatozoa from a carefully chosen donor should be used to fertilise the ovum. Such couples are, and must be, living a full married life together, which cannot always be said of cases where A.I.H. is employed.

The request for A.I.D. comes, more often than not, from the husband, who will either approach his general practitioner (not always with success) or make his own, often difficult, search for a doctor who will help him and his wife in this way.

The doctor who performs A.I.D. must interview both husband and wife and be assured that the request comes from both. He must further assure himself that the matter has been properly considered, and that the couple can offer to the child not only a reasonable standard of living but also the love and support that should be every child's heritage. The doctor must be satisfied that the couple are mature and sensible—in a word, that they are childworthy.

If the request comes through a general practitioner much of this preliminary "screening" will already have been done, for the couple will have been referred for A.I.D. only if the family doctor regards them as suitable.

If the request comes from the couple, the screening and the final responsibility of deciding whether or not they should be helped in this way falls upon the doctor who is to perform A.I.D.

It is not always easy to refuse, but some couples have to be turned down—for example, where one or both are too old or medically unfit, where there is obvious instability and tension, or where one partner has persuaded the other unwillingly into the consulting-room. In such cases it is often possible to find infertility factors in the wife, so that the doctor can advise against A.I.D. on that score as well as explaining the other difficulties.

The responsibility, though a heavy and anxious one, is no more onerous than that assumed by those who arrange adoptions. Indeed, in some ways, the chances of making mistakes are fewer, for an A.I.D. child will at least be reared by its own mother. The handing out of a child, however engendered, to any couple who ask for one is a big responsibility, but experience suggests that it is more likely to go right with A.I.D. than with adoption.

No doctor in his senses would try to persuade a couple to accept A.I.D. as a solution to their barrenness against their own judgment, religious beliefs, or ethical code. Nor would he agree to use A.I.D. without the knowledge and willing consent of the husband.

The manner in which a child is conceived is surely the parents' private concern provided that they deal fairly with their A.I.D. child (and experience shows that they do) and provided that, by having such a child, they do not defraud some other member of the family of a lawful inheritance without agreement. Such family agreements are made and will probably become more common. For example, the parents of a sterile son with a farm to hand on, which would have been sold if he had had no children, strongly advised him to allow his wife to receive A.I.D. These children have brought great happiness to the whole family, particularly to the grandparents.

There seems to be no point in informing the child, at any stage of its growth, that it is a " test-tube " baby. It is better to let it grow up accepting those who care for it as its parents.

THE OPERATION

Since A.I.D. is not a service that can be properly offered under the National Health Service, and since it involves complicated arrangements, the most suitable place for it to be done is the doctor's consulting-room. The timing of the procedure so as to give the best chance of success is difficult, especially for women who have to travel long distances to see the doctor and can perhaps manage only one visit a month. The correct day in the cycle can be decided only by studying the basal temperature charts, vaginal smears, the characteristics of the cervical mucus, the average length of the patient's menstrual cycles, and so forth.

It is always wise to explain to the couple that normal sexual intercourse should not be restricted during the period that artificial inseminations are being carried out.

The number of attempts needed to achieve pregnancy varies greatly from case to case, ranging from 1 to 4 times per cycle for from one to twenty cycles. The semen used should if possible be not more than three hours old, though success has been achieved with semen considerably older. It is best collected in polyethylene tubes and kept at cool room-temperature.

American workers [1] claim successful results with semen preserved by deep freezing, but their results have not been confirmed in this country.

THE DONORS

One of the most difficult and responsible tasks confronting the doctor who carries out A.I.D. is building up a list of donors. These should be personally known to him, but only in special and rare circumstances to the recipient. It is fundamental that the transaction remain entirely impersonal.

Donors must not only be fertile but also physically and mentally fit. They should be of various types and it is an advantage to have a long list from which to choose. The serological tests of donors must be negative and their blood-groups ascertained. They are used more or less in rotation, but some attempt is made to match the skills and aptitudes of the donor with that of the husband. A donor may be called upon from twice to twenty times a year.

Experience shows that, though couples may show interest in the physical and mental characteristics of the donor, once a child is conceived and born no further reference is made to him, unless another child is desired, when parents almost always ask for the same donor.

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Donors should preferably be sought among married men with families of their own who donate with their wives' knowledge and consent, and without fee. The all too common gibes that donors must regard themselves as supermen or, alternatively, that they are irresponsible persons who donate for gain and without regard for the destiny of their seed are unfounded. Men of the right calibre will not donate unless they can trust the doctor responsible and can feel assured that their help is given only to childworthy couples.

THE CHILDREN

The bogy of intermarriage between half-brothers and half-sisters has been much exaggerated: the risk is certainly less than that of marriage between adopted or illegitimate sibs. The number of illegitimate births per annum is over 50,000 and of adoptions about 15,000, whereas an outside estimate of the annual number of A.I.D. births is 500. Though the donors may be drawn from a limited area, this is not true of the recipients, who come from far and wide.

A register of A.I.D. births, which would be open to inspection under proper safeguards by authorised persons, would put many minds at rest, but whether a satisfactory system could be devised can be decided only by those with expert knowledge of the legal and administrative intricacies of registration. It is, however, important that doctors practising A.I.D. should keep careful clinical records of every case; and, until enough information has been collected to answer more fully the questions in so many thoughtful minds, every effort should be made to keep in close touch with A.I.D. families.

In a series of more than 70 cases only 2 have been lost sight of, and nearly a third of them have returned for further A.I.D. In all there were 93 pregnancies in 70 women (69 live births, 4 stillbirths, 14 miscarriages, and 6 still in utero). The children born are satisfactory both physically and mentally. Though the children have a resemblance to the donor they tend to resemble more nearly their mothers and " fathers "—partly no doubt because they absorb their habits and facial expressions. The families have developed as a harmonious whole. So far no congenital defects have come to light. These A.I.D. families form only a small part of a much larger series of infertile couples investigated and treated, and since all cases are followed up there is no reason why A.I.D. families should feel conspicuous.

NATIONAL VARICOSE FOUNDATION

IN July, 1956, the National Varicose Foundation was established and given four aims:

(1) To sponsor the building and maintenance of an independent varicose clinic, to be staffed by a team of specialists who could train and encourage others to take a deep interest in varicose veins and their treatment.

(2) To provide funds (*a*) to expand the present facilities at hospitals and clinics in Great Britain; and (*b*) to support clinical and scientific research at these and other centres.

(3) To explain to sufferers the underlying cause of their condition and so help them towards prevention, alleviation, and cure.

(4) To convince the authorities of the need for specialist-staffed varicose clinics and to help and advise, if requested, on the setting up of these within the framework of the National Health Service.

At a reception in London on May 15, Dr. STANLEY RIVLIN, chairman of the Foundation, spoke of the five million people in Great Britain with varicose veins and the half-million of

them whose legs were ulcerated. The problem was gigantic; but it was the best of lost causes, for it was one that could be rescued. The present focus of the Foundation's aims was the erection of a specialist unit for outpatient and inpatient treatment and for research. A building fund has been set up from which it is hoped that a substantial new unit will emerge. Plans have already been prepared for this new London Varicose Clinic, which will contain an outpatient department, an inpatient department with 32 ward beds and 8 single rooms, a twin operating suite, a research department, and a lecture hall.

The design of the outpatient department was based on experience gained in the present London Varicose Clinic at Battersea. Patients under treatment are dealt with together in one large room, where leg bandages are removed, and where patients sit talking until they are called in groups of 4 or 6 for treatment in a separate room. The inpatient department had been divided into 4 wards, each of 8 beds. The beds would normally be used for the treatment of varicose veins, for the treatment of ulcerated legs was ambulatory. Postoperative treatment of varicose veins included walking for five minutes every two hours, on the first and second postoperative day. Corridors had therefore been made wide to allow room for ambulatory inpatient traffic.

The twin operating suite consisted of a series of concrete "bubbles" intercommunicating to permit a "conveyor-belt" system of operating. A thorough operation on one leg by a single surgeon often took up to $1^1/_2$ hours, and it was proposed to have a surgical team, the senior member to carry out only the vital part of the operation—the juxtafemoral ligation or juxtapopliteal ligation. His first assistant then continued with the phlebectomy; and the second assistant did the sewing up and bandaging. It should thus be possible for one team to operate successfully and thoroughly on four cases a session, instead of the normal two.

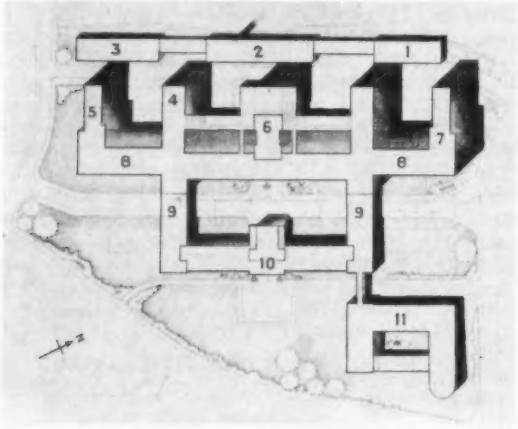
The unit was designed by Denis Clarke Hall, F.R.I.B.A., in association with Robin de Beaumont, A.R.I.B.A., honorary architect to the Foundation.

At the reception, Sir ARTHUR PORRITT wished the venture well; and guests were able to inspect a model of the proposed new clinic, which is estimated to need about £400,000 for its completion.

SHEFFIELD'S NEW TEACHING HOSPITAL

ON May 17, Queen Elizabeth, the Queen Mother, laid the foundation of the teaching hospital which is to be built on a site about a mile from the centre of Sheffield.

Plans for the new hospital were first discussed over thirty years ago. Shortly before the late war an appeal was launched to build it, and the trustees still hold a considerable sum of money collected at that time. An architectural competition was also held, which was won by the architects of the present building, Messrs. Adams, Holden, and Pearson. But the war and post-war difficulties prevented building and it was not till 1953 that it proved possible to open the Charles Clifford Dental Hospital which was part of the original plan and which stands on an adjacent site.



The new hospital when it is complete will be a comprehensive acute general hospital with 800 beds. It will of course be closely associated with Sheffield University, and it is ideally situated to form a hospital/university campus. It is also readily accessible to patients and visitors. It stands on some ten acres of land, and advantage has been taken of the sloping site to form interesting groupings of buildings and yet allow easy and convenient communication between them. At the highest level, at the back of the site, will be gathered the various service departments with a self-contained area for the delivery of goods. The inpatient block will be in the middle of the site with a through road to it. The outpatient and the laboratory block will be at the lower level and will also have its own road. The two blocks will be linked by corridors. The whole building is to be constructed in vertical blocks so that the planned extensions may be made horizontally.

When the outpatient department is completed it is hoped to go on as soon as may be with the next stage, which will provide 52 beds for inpatients, and then to continue the building programme steadily until the whole hospital is complete.

1. Laundry
2. Boiler-house
3. Works department
4. Professorial unit
5. Staff-nurses' hostel
6. Main kitchen
7. R.M.O.s' hostel
8. Ward blocks
9. Polyclinic phase 2
10. Polyclinic phase 1
11. Medical sciences block

Occasional Survey

THE CONTRIBUTIONS OF SURGERY TO THE TREATMENT AND UNDERSTANDING OF PARKINSONISM

LESLIE OLIVER
M.B. Lond., F.R.C.S., F.A.C.S.

NEUROSURGEON, WEST LONDON HOSPITAL, ROYAL NORTHERN HOSPITAL, AND WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, LONDON; SENIOR NEUROSURGEON, THE NEUROSURGICAL CENTRE, OLDCHURCH HOSPITAL, ROMFORD

ALL methods of surgical attack in Parkinson's disease and postencephalitic parkinsonism aim at relief of symptoms. No operation eradicates either of these diseases or arrests their evolution. Tremor, often the most obvious manifestation, has claimed most attention from the neurosurgeons, but although it is the commonest early symptom and is present in variable amplitude in most patients with advanced parkinsonism it is far from being the chief presenting symptom when patients seek surgical treatment. Most patients then complain of disability; despite adequate muscular power there are slowness and poverty of movement. Some patients do, however, ask for relief from tremor, either because it embarrasses them or because it interferes with function.

OPERATIONS

The operations will not be discussed in the order in which they were introduced but in an anatomical sequence which throws light on the route followed by the abnormal nervous impulses in the Parkinson syndrome.

Operations directed at Globus Pallidus

While attempting partial section of one cerebral peduncle for contralateral tremor Cooper inadvertently damaged the anterior choroidal artery (fig. 1) and was obliged to coagulate it. Pedunculotomy was then abandoned, but the patient was freed from tremor on the opposite side, although there was no hemiplegia and there were no other abnormal neurological signs which, according to the anatomical work of Abbie (1933), were to be expected.

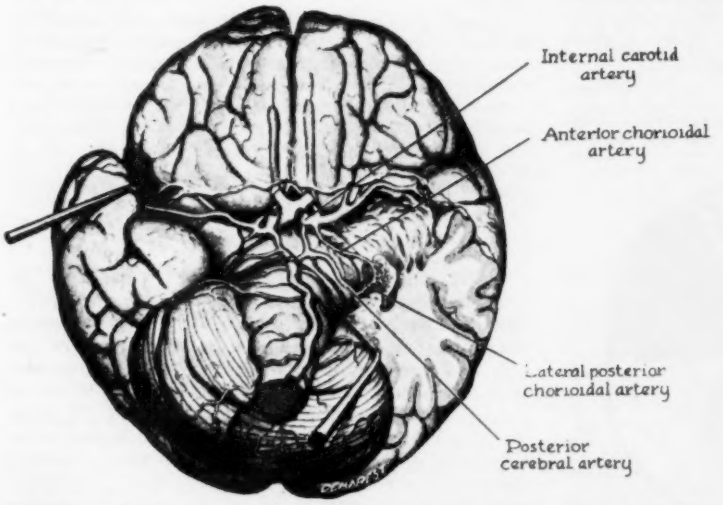


Fig. 1—Part of left temporal lobe has been removed to expose anterior choroidal artery. By courtesy of Carpenter, Noback, and Moss (1954) and the Editor of *Archives of Neurology and Psychiatry*.

As a result of this experience Cooper (1953) continued to coagulate the anterior choroidal artery for Parkinson's disease after angiography to demonstrate the artery and any variation of its origin. It usually arises from the internal carotid artery just above the posterior communicating artery (fig. 1). This operation relieved contralateral tremor in 55 patients.

Although Abbie (1933) showed that many important structures could be stained by injecting dye into the anterior choroidal artery, Mettler et al. (1954) showed that bilateral coagulation of the artery in the chimpanzee produced infarction of only a small part of each globus pallidus.

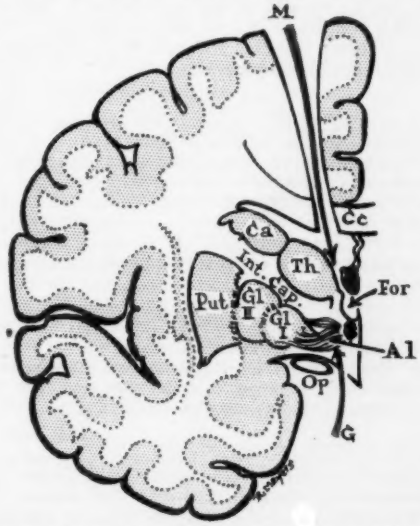


Fig. 2—Russell Meyers' diagram: Al, pallidofugal fibres (upper bundle is fasciculus lenticularis and lower bundle is ansa lenticularis); M, Meyers' original transventricular approach to these fibres; G, Guiot's approach; Ca, caudate nucleus; Th, thalamus; Put, putamen; Gl. I, medial segment of globus pallidus; and Gl. II, lateral segment of globus pallidus.

Carpenter et al. (1950) produced choreiform movements in monkeys by partially destroying the subthalamic nucleus and either reduced or eliminated these movements by partially destroying the contralateral globus pallidus. These experiments were subsequently checked histologically.

Coagulation of the anterior choroidal artery carries at least a 10% mortality and, despite the optimism of its originator, sometimes causes severe contralateral hemiplegia and other serious neurological complications. This operation is therefore now rarely done, having given place to less risky methods of destroying the globus pallidus—e.g., injection of procaine in oil (Narabayashi and Okuma 1953), injection of alcohol (Cooper and Poloukhine 1955), implantation of radioactive isotopes (J. B. Campbell, personal communication), and mechanical means (Obrador 1957).

The most popular of these methods is injection of alcohol (chemopallidectomy) through a burr-hole, orientation being obtained by pneumoencephalography. The mortality in 245 cases was 2·8%, and postoperative hemiplegia developed in

2% of patients; relief of tremor and rigidity was obtained in 70% (Cooper 1956).

Our knowledge of the role of the globus pallidus in the mechanism of parkinsonism is derived from the pioneering work of Meyers (1940, 1942), who tried several operations directed at the basal ganglia, but the most effective is section of the pallidofugal fibres—the ansa lenticularis and the fasciculus lenticularis (fig. 2). Originally these fibres were cut through the lateral wall of the third ventricle approached through the frontal lobe and the anterior horn of the lateral ventricle. Meyers (personal communication) reported the results of 22 such operations as follows:

	No. of patients
Much improved (tremor-free; some rigidity persisting; no neurological deficits due to surgery)	8
Improved (tremor and rigidity reduced but not abolished; or, if abolished, attended by some degree of post-operative dyspraxia, paresis, or spasticity)	10
Unimproved	2
Operative mortality	2

Patients were followed up for at least 18 months and at most 13½ years.

Meyers (personal communication) has abolished tremor and rigidity in 3 patients by subjecting the ansa lenticularis to irradiation by multibeam ultrasonic waves.

Other workers claim good results from division of the pallidofugal fibres by other methods (Fénelon 1952, 1953, Guiot and Brion 1953, Spiegel and Wycis 1954).

Operations on Cortical Projection Areas

Horsley (1909) was the first to operate on the frontal cortex for involuntary movements. He showed that removal of the precentral gyrus, area 4 of Brodmann, abolishes contralateral athetosis. Bucy (1948, 1951) has also excised the precentral cortex for choreo-athetosis and for tremor. The involuntary movements were eliminated at the expense of spastic paralysis of the affected limbs.

Ward et al. (1948) produced alternating tremor at rest in monkeys by electrocoagulation of parts of the reticular formation of the midbrain, and temporarily eliminated the tremor by excision of the motor and premotor cortex (Brodmann's areas 4 and 6).

Operations on Non-pyramidal Corticofugal Fibres

One of the operations tried by Meyers (1942) was section of the anterior limb of the internal capsule approached through the anterior horn of the lateral ventricle and exposed by removal of the head of the caudate nucleus. After this operation there are transitory hemiparesis and persistent reduction of amplitude of the tremor.

Pedunculotomy

Division of the lateral two-thirds of one cerebral peduncle for contralateral involuntary movements was first done by Walker (1949). In this operation both pyramidal and non-pyramidal fibres are divided. There is diminution or elimination of tremor, but severe hemiplegia results.

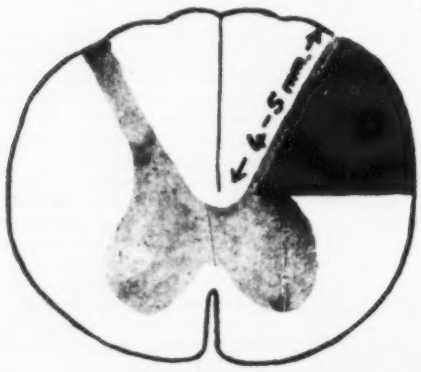


Fig. 3—Putnam's (1940) chordotomy.

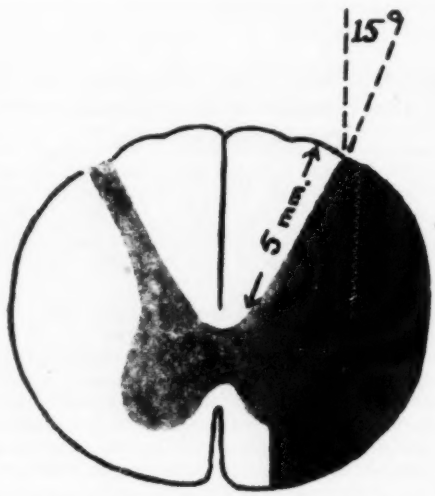


Fig. 4—Complete section of lateral column.

Operations on Spinal Tracts

One of the patients whose record appears in James Parkinson's (1817) monograph had a cerebral hæmorrhage and immediately lost the tremor on the hemiplegic side. This fact, together with the observation that section of the pyramidal tract in monkeys causes little or no lasting disability, led Putnam (1940) to divide the crossed pyramidal tract unilaterally at the second cervical level for unilateral tremor (fig. 3). There was reduction of tremor in 15 of 22 patients, and most of the patients completely recovered from the post-operative hemiplegia. After this operation complete relief of tremor is not obtained; the tremor tends to return to its former amplitude (Oliver 1953). Unilateral tremor can, however, be entirely eliminated by complete section of the lateral column of the cervical part of the spinal cord (Oliver 1950) (fig. 4).

Operations on any part of the pyramidal system should only be done on patients who have had hemiparkinsonism for at least five years without the slightest evidence of involvement of the other side. The price of elimination of tremor by complete section of the lateral column is permanent hemiparesis and contralateral analgesia and thermanæsthesia of variable level but usually reaching the inner border of the arm. Of 20 patients 18 were entirely relieved of tremor and 2 were only partially relieved. Other workers have confirmed the results of this operation (Sjöqvist 1954, Gaches et al. 1955).

DISCUSSION

Pallidectomy is the most promising advance in the treatment of parkinsonism and the most generally applicable operation. It can be used both in unilateral and in bilateral parkinsonism; in the latter one side is done first and the other after an interval of at least three months. This operation has a more lasting beneficial effect on rigidity and motor function than on tremor. In long-standing unilateral parkinsonism in which tremor is the presenting symptom, either because it is embarrassing to the patient or because it is sufficiently severe to interfere with function, section of the lateral column is the more effective operation, but nevertheless unilateral pallidectomy should be tried first in such cases, because the

patient may be satisfied with this, and damage to the pyramidal system is usually avoided.

The neuronal degeneration found in parkinsonism cannot be better defined than by quoting Greenfield and Bosanquet (1953):

"... examination has shown the lesions in the basal ganglia in our cases of idiopathic Parkinsonism to be slight by comparison with those in the brain-stem, and to differ in no respect from those found in many senile and presenile brains from cases with no symptoms of Parkinsonism. In post-encephalitic cases the lesions in the basal ganglia are often more definite, but in them also they are much slighter than those in the substantia nigra. . . . There is general agreement that in post-encephalitic Parkinsonism the *substantia nigra* is severely damaged and in some cases is reduced to a glial scar in which very few pigmented cells can be seen. In idiopathic paralysis agitans the lesions in the substantia nigra although usually less severe than in post-encephalitic cases, are always very evident when the various cell groups in this nucleus are compared with the normal."

In parkinsonism the affected neurons are in various stages of degeneration. Brain-stem tumours and infarcts which completely blot out these cells do not produce parkinsonism, which therefore results from abnormally discharging neurons rather than from a release mechanism.

Electrolytic lesions of the reticular formation of the mid brain in monkeys cause tremor, and these lesions are composed of a zone of destruction surrounded by a zone of *degeneration*.

It is suggested that the neurons of the substantia nigra —pars compacta or central portion (Mettler 1948)—send abnormal impulses to the globus pallidus in the strionigral tract, now recognised as an ascending pathway, although its name suggests that it is a descending tract (Keller and Harris 1941, Mettler 1943, 1944, 1945a and b, Ranson and Ranson 1942). The abnormal discharges leave the pallidum in the pallidofugal fibres (ansa lenticularis and fasciculus lenticularis), some of which are known to enter the ventrolateral nucleus of the thalamus (Rasmussen 1945). (It will be recalled that destruction of the globus pallidus or of the pallidofugal fibres diminishes or abolishes contralateral parkinsonism.) The disordered impulses presumably then pass from the thalamus to the motor cortex and thence along the pyramidal or intimately related fibres, because excision of the motor cortex, pedunculotomy, or lateral-column section abolishes tremor. The abnormal impulses are finally fed into the anterior-horn cells and thus interfere with muscular tone and function. Sensory pathways seem to play but a passive role, because neither division of sensory nerve-roots of affected limbs (Pollock and Davis 1930) nor division of the posterior columns of the spinal cord in the cervical region (Putnam and Herz 1950) has any effect on parkinsonism.

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Conferences

NUTRITION AND HEALTH IN THE WEST INDIES

THE third annual meeting organised by the Standing Advisory Committee for Medical Research in the British Caribbean was held at the University College of the West Indies on April 12 and 13, under the chairmanship of Prof. A. C. FRAZER (Birmingham) and Sir GEORGE PICKERING (Oxford). Food in relation to health and disease was the theme.

Agriculture

Dr. H. C. MILLER, director of the Jamaican Department of Agriculture, emphasised the need for increased agricultural production in underdeveloped countries. Three-quarters of the land in Jamaica was mountainous, and there was available for production only $^{7}/_{8}$ of an acre per head of the population. In addition $^{7}/_{8}$ of the 200,000 farms were under 10 acres. Thus scientific farming or even the introduction of improved methods was time-consuming.

Dr. G. GIGLIOLI (British Guiana) said that two-thirds of the workers on the sugar estates in British Guiana have been rehoused and provided with their own plot of land for vegetable production and poultry rearing. Many families could produce more than enough for their own needs. Malaria eradication had resulted in considerable improvement in nutrition.

Nutrition Surveys

A pilot nutrition survey of five low-income areas in Jamaica was reported by Dr. K. STANDARD, of the Government Nutrition Research Team. The incidence and distribution of dental caries was shown to be related to the fluorine content of the drinking-water. The children were thin and underweight according to British and American standards.

Elementary-school children in British Guiana had been studied by Dr. C. C. NICHOLSON in 1950, 1951, 1952, and 1958. Since 1954 a snack meal consisting of skimmed milk, food-yeast-enriched biscuits, and fish-liver-oil capsules had been distributed to the schools. In the 1958 survey the effect of this was apparent. There had been a remarkable improvement in health; but there were still some skin, eye, and mouth lesions that might indicate slight residual vitamin A and B deficiency.

The value of milk supplements was also stressed by Dr. L. HARNEY (St. Kitts), who pointed out that there had been a significant drop in infant mortality, compared with the "pre-milk era", which did not appear to be due to other causes.

The failure of vitamin B_{12} and aureomycin supplementation to influence the growth of protein-deficient Jamaican children was reported by Prof. I. F. S. MACKAY (U.C.W.I.).

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Veno-occlusive Disease

Experimental production of veno-occlusive disease of the liver in calves was described by Prof. G. BRAS (U.C.W.I.) and Dr. D. M. BERRY (Jamaica). *Crotalaria fulva* was the toxic plant. The condition appeared to be closely similar histopathologically to that in man.

Mayaro Virus

Dr. W. G. DOWNS (Trinidad Regional Virus Laboratory) reported on the immunity to Mayaro virus found in the inhabitants of several West Indian territories. It was confined to British Guiana and South-East Trinidad.

Malnutrition

Malnutrition in infants was discussed by Dr. B. E. R. SYMONDS (Trinidad). In 69% of children who died between the ages of 1 month and 1 year, malnutrition was the sole or major contributory cause. This was considered to be mainly due to ignorance or apathy on the part of the mother.

Kwashiorkor

10 patients with kwashiorkor who had recovered were reviewed three and a half to five years later by Dr. E. H. BACK and Professor BRAS. All were well; 5 were below normal height and weight for their age, 4 had hepatic enlargement. All the livers were histologically normal, including 1 that had shown fibrosis several years previously.

Megaloblastic Anæmia

Nutritional megaloblastic anæmia in children about 1 year of age was reported by Dr. J. E. MACIVER and Dr. E. H. BACK (U.C.W.I.). This had been noted in 50 children over a two-year period—26% of all cases of malnutrition under the age of 2 years. In these patients the hæmoglobin was less than in the usual cases of malnutrition, being 7 g. per 100 ml. or less. All cases responded dramatically to the oral administration of folic acid 10 mg. a day.

Plasma-protein Levels

A paper by Dr. B. B. G. NEHAUL (British Guiana) showed that in a group of East Indian patients the plasma-albumin level was lower and the plasma-globulin level higher than might be expected in a comparable series in Britain or America.

Feeding Experiments

Mr. C. MENDES (M.R.C.) showed that in weanling rats fed on a low-protein, high-carbohydrate diet growth was arrested and muscle-protein was considerably reduced—a situation similar to that observed in the protein depletion in the infant. On refeeding there was a lag period before the synthesis of new tissue reached a maximum rate.

Incidence of Cardiovascular Disorders

The low incidence of myocardial infarction in the Jamaican patient was pointed out by Dr. J. A. TULLOCH (U.C.W.I.).

The high incidence of aortic atherosclerosis in the Jamaican was demonstrated by Dr. W. B. ROBERTSON (U.C.W.I.). The findings were comparable to those observed in New Orleans. On the other hand myocardial infarction appeared to be relatively uncommon, approximating more closely to the incidence in Guatemala.

Placental Changes

Dr. W. B. ROBERTSON and Dr. H. G. DIXON (U.C.W.I.) reported a combined clinical and pathological study of the maternal blood-vessels at the placental site in normotensive and hypertensive pregnancies in women undergoing cæsarean section. Distinct changes in the vessels were noted in pre-eclampsia and in essential hypertension. Intimal proliferation or swelling with considerable reduction in the lumen or sometimes complete occlusion of the lumen was found in the muscular and decidual vessels in the eclamptic or hypertensive woman.

Adrenal Glands

The adrenal gland was shown to be notably smaller in the Jamaican patient than in the British subject by Dr. G. STIRLING (U.C.W.I.). This change involved only the cortex and it was particularly distinct in children.

In England Now

A Running Commentary by Peripatetic Correspondents

THE importunate assimilators of reprints provide problems for impecuniary authors who do not work in university departments which usually pay both for reprints and for their postage. Shall the author limit himself to the number of reprints given him by the editor and shall he send them, as some scientists do, only to those whom he knows to be working in the same field? If more reprints are to be purchased (and at a rising cost), how is he to forecast the popularity of his latest masterpiece? Will 200 meet the demands of these insatiable addicts? And if one's secretary says firmly, "No, 50 will do," how then to judge priorities when the postcards flow in like a river in spate?

If the principle of first-come first-served is accepted, then the few courteous Englishmen who wrote you a pleasantly phrased letter will soon be outnumbered by the senders of the stereotyped postcards (with a printed signature) from North America. Then even the nice American from Baltimore, who gave you and your wife too many rocks on the rye last summer, and who scrawls "Love to Linda" (her name is Lucy) on his postcard, will be disappointed. Rejected, too, will be that splendid solitary specimen of the anglophil Frenchman, the only physician in France who can understand what you have written. Forgotten, also, will be that delightful South African —one of the few who replied in gratitude last year, having received an earlier and signal mark of your favour. Omitted, too, would be those doctors behind the Iron Curtain, in Hungary and Rumania for example, towards whom one would be honoured to make so trivial a gesture of fraternity. Rebuffed also the darling physician from Bucharest, who sent a postcard picturing the theatre at Cluj, and on the postage-stamp a portrait in sepia of Eminescu—a brilliant impression like an 18th-century mezzotint. And, even more regrettable, to have left unsatisfied the redoubtable Latinist from East Berlin who wrote:

Honoratissimus Dr. X.

Ista labor multum mea interest, quoniam similis investigationes perfero. Oro, mittatis ad me supra dictum separatum atque alia separata similis generis:

Manganese Deficiency in Cerebral Disorder.

In publico proponitum est: Lancet I, Volume MCMLVIII, pagina DLXIII. Multas gratias habete.

Vale.

Or would you wish, Mr. Editor, that I should enhance the circulation of *The Lancet* by refusing the requests of all these obsessional collectors, believing, as you and I do, that *The Lancet* is a journal to be bought and not merely to be read?

• • •

The parish church of Wirksworth, Derbyshire, is known for its beauty and even magnificence; and it is one of the oldest foundations in England, for a church certainly stood there in the 7th century. There are many monuments in it to members of ancient local families—Lowe of Alderwasley, Blackwall of Blackwall, and Gell of Hopton—but there is also a simple mural tablet behind the pulpit which reads:

IN MEMORY OF
WILLIAM WEBB, M.D., F.R.C.S., J.P
DIED 27TH AUGUST, 1890,
Aged 59.

I had often wondered how this highly qualified doctor came to have a memorial in this charming but tiny little country town. So I looked up what the journals of the day had had to say about him, and he appears as indeed a man of parts. He was in practice in Wirksworth for over twenty years and seems to have just about run the place:

"Dr. Webb was earnest and thorough in everything that he undertook, whether it was in politics in which he took an active interest or in the promotion of the sanitary improvement of Wirksworth which he sedulously advocated or in pleading the cause of the Cottage Hospital of which he was, from its foundation, the Medical Officer and active supporter."

One can imagine the enthusiasm with which this man of drive and initiative got the cottage hospital going: at last somewhere in which the new Listerian surgery could be practised in a proper manner.

But his health obliged Dr. Webb to retire early from practice, and it is not perhaps too wide of the mark to hazard the guess that when he did so, his partner felt the need of a successor with surgical ability. At any rate, in 1877 there came to Wirksworth none other than Frederick Treves. True, he soon went back to London and to fame, whereas Webb's reputation remained local. But I feel that this Wirksworth surgeon deserved his modest immortality in stone at least as much as the 16th-century grandees lying in their sculptured tombs in the chancel.

* * *

Would you agree that the average English-male/American-female city-dweller has a tailored look, as if he/she had been poured into his/her suit? That he/she has every hair neat and slicked down as if he/she had just come from the barber's/hairdresser? And that he/she generally wears cuff-links/costume-jewellery and a set expression? While the average English-female/American-male city-dweller has a more casual look, as if she/he had bought her/his suit off the peg? That she/he has a more elemental hair-do, as if she/he had done it her/himself? And that she/he is inclined to wear rubber-soles/galoshes and a breezy expression?

* * *

The rugger type on the Holborn escalator nearly knocked me over in his rush. But he found time to glare over his shoulder. Now I can understand that he was in a hurry and had to push me out of his way; but what I can't understand is why he should bear me a grudge for it. There is a lot of psychopathology to be explored on London's underground in the rush hour.

* * *

A luxurious bank has been opened on the south side of Piccadilly Circus. It is intended primarily for overseas visitors and was lately described in an evening newspaper as follows: "The doors are of silver bronze bordered with red marble quarried from Oran, the source once used by the Romans for the Pantheon. The close-carpeted interior has deep armchairs for customers."

What a contrast to the hospital scene 1958, where too often highly trained and qualified doctors, nurses, medical auxiliaries, are carrying out complex modern treatments in old buildings with out-of-date annexes, poor equipment, and overcrowded casualty and outpatient departments. The general standard of hospital decoration and hygienic cleanliness is related, not to medical needs, but to a "pruned" hospital budget. How unfortunately the hospital, which is in continuous action 24 hours a day, compares with the bank. How wonderful it would be if banks and other prosperous business concerns could be induced to sponsor and help the hospital capital development plans so that doctors will no longer be ashamed of the premises on which they work.

* * *

"I had a pain in the mid watch," said the patient (from Portsmouth).

"Where's that?" asked the house-surgeon (from Pakistan).

"It's not where, it's when. He means he felt it in the early hours—about pit-time," explained the staff-nurse (from the West Riding).

* * *

At Brightsea did the Councillors
A stately pleasure ground decree:
Where through a pipe not far away
Town sewage bubbled on its way
Down to a sunlit sea.

"A sewerage plant might there be placed,"
The M.O.H. had shyly said.
"What does the fellow contemplate?
The scheme would cost a five-bob rate,
Chap must be off his head!"

Letters to the Editor

THE ROYAL COMMISSION AND RESTORATION OF GENERAL PRACTICE

SIR,—Mr. Wilfrid Adams, in his letter of May 10, makes some outstanding points on which I hope you will allow me to comment.

"A successful outcome of the work of the Royal Commission depends on radical upgrading of conditions in general practice." At present what incentive is there to encourage good work or good conditions when the doctor who runs a first-class practice from first-class premises with all necessary ancillary help does not get paid one penny more than the doctor who practises from a lock-up surgery. It is only heads that count. The worst doctor gets the same money per head. Surely now is a wonderful opportunity for the Royal Commission to make recommendations which will get this iniquitous system altered.

May I make some suggestions?

(1) *An expense factor.*—This would very broadly cover the G.P.'s practice expenses as allowed for income-tax purposes and would directly encourage good work.

(2) *Some form of merit award.*—This would be given to those doctors who themselves do for their patients all the work for which they have been trained and are competent to do instead of dumping their "time-consuming cases" on the local hospital—a much more expensive procedure.

(3) *Awards for higher degrees and diplomas.*—It is true that some men find it much more difficult to pass exams than others, but would not membership of the College of General Practitioners show that the holder of this distinction was a man who had given an undertaking to keep himself up to date and to maintain the highest standards of medical practice and who was therefore worthy of recognition?

(4) *A locality allowance* (not to be confused with a mileage allowance).—This would be given to doctors who practise in difficult areas or where a large number of elderly people reside.

(5) *Payment for experience.*—At present in medical practice the experienced G.P. is paid exactly the same as his youngest colleague and has to work at top pressure till he retires or dies, whereas in most professions men earn their maximum rewards in late middle life with corresponding slackening of effort. This could be achieved in many ways but would probably be most effective if it commenced about 45, rising slowly by yearly increments until age 60, when it would remain stationary until retirement. Not only would a G.P. by this method be able to ease his work by a reduction in his list, without reduction of income; but it would also be a safeguard against any reduction in the ultimate amount of his pension.

The all-important time factor

How is it possible, under the present system of remuneration, to give the average general practitioner the time to do his work properly, to give his patients a first-class service, and at the same time allow him opportunity for reading and reflection. This point may well be causing thought amongst the members of the Royal Commission; indeed Sir Hugh Watson is reported to have remarked on it.

To give a really good service in some 20-odd years of general practice I have found that for morning consultations fatigue begins to set in after about the 15th patient. Visits vary according to travelling time; but 12 can be done comfortably, taking interest in each, before the work gets fatiguing. This, followed by about 12 patients at night, gives a total of some 40 items of service per day, or a list of about 2500 patients. At the present rate of remuneration it is argued that a doctor with a family cannot live and meet his expenses. He is therefore forced to take more patients than he would otherwise like to balance his budget.

Is it not possible that some of these suggestions could go a long way towards helping the G.P. to maintain a first-class service without being forced by financial necessity to take on more than he can efficiently manage?

Mr. Adams has stressed the material factors: just as important in my view are the psychological factors, the sense of bitter frustration, of being treated unfairly, of rankling injustice that is deep in the minds of so many doctors at the present day, which must be eradicated if we are to attract recruits of the right type into the profession.

Worthing, Sussex. HAROLD LEESON.

MORTALITY FROM CEREBRAL VASCULAR AND CORONARY DISEASE AMONG THE SOUTH AFRICAN BANTU

SIR,—In his stimulating letter of March 8 (p. 528), Professor McMichael, referring to coronary-artery disease, states that "others would have us believe that the diet of the Bantu would save us, but the Pietermaritzburg pathologists, Laurie and Woods, think there is as much atheroma in the Bantu as in Barts". As two of those "others", we should be glad to comment on this statement.

In the first place, the burden of Professor McMichael's letter relates primarily to *coronary-artery* disease and mortality. In their comparison with Barts, Dr. Laurie and Dr. Woods [1] were referring to *cerebral vascular* disease in the South African Bantu. While many believe that the diet of the Bantu is the factor of predominating influence in almost completely protecting them from dying from coronary-artery disease, no-one, to our knowledge, has speculated that their diet has an equal protecting effect against cerebral softening and hæmorrhage. In this respect it is interesting to note that countries may differ considerably in the ratio of their mortality from these causes.

(1) Mortalities may be high, approximately equally so—e.g., England and Wales, Denmark and Sweden.[2 3]

(2) Coronary-disease mortality may be low, but that from cerebral lesions high—e.g., France, Italy.[2 3]

(3) Coronary-disease mortality may be *very* low, yet cerebral disease may be a significant cause of death—e.g., among the South African Bantu in Johannesburg; our information indicates that the former mortality is responsible for about 0·6% of deaths, and the latter, 3–4% of deaths.[4 5]

(4) Mortality from both diseases may be virtually nil—e.g., among Africans in Kampala, Uganda; in Dr. Davies' series of 2994 necropsies, coronary-artery disease mortality was 0·03%; that from cerebral vascular lesions, 0·3%.[6]

But to return to our local Bantu (for whom death certificates are required), it is evident that while mortality from coronary thrombosis presents no problem, this is not the case with cerebral vascular disease.[7] It must be stressed, however, that mortality from cerebral vascular disease is still far less than among local white populations.

Turning now from the mortality aspect to that of atheroma: at this hospital, the proportion of deaths from cerebral softening and hæmorrhage is higher than in Pietermaritzburg; the impression gained, however, is that atherosclerosis of the cerebral vessels appears gross in a smaller proportion of relevant patients than is the case in the series of Laurie and Woods.[1] Incidentally, these workers stress "the high prevalence of atherosclerosis and its cerebral complications in Bantu women—contrary to the findings in people of European descent" and quote Dr. Lober [8] and the *British Medical Journal* [9] in support. If this observation relates specifically to cerebral atherosclerosis and mortality, it is incorrect. In the first place, there is a female preponderance of mortality from cerebral lesions in all the countries listed in the relevant World Health Organisation publication.[3] More to the point, Dr. Lober and the *British Medical Journal* both have in mind *coronary* sclerosis—the word *cerebral* does not even appear.

It seems that the pathological lesions in the cerebral vessels of the South African Bantu are compatible with the mortality obtaining. On the other hand, according to many observers, the extent of the lesions in the aorta and coronary vessels seem out of proportion to the very low mortality from coronary occlusion.

In 1946, in a comprehensive study on Johannesburg Bantu, Becker [10] observed that "in spite of the fact that the coronary vessels are frequently in a diseased condition and the myocardium as frequently damaged, coronary thrombosis is an uncommon lesion". Furthermore, in his letter in your issue of May 10, Professor Becker reiterates that "on occasion" the Bantu develops atherosclerosis as severe as that seen in the local white population. In the study of Higginson and Pepler [11] on 523 Johannesburg Bantu necropsies, about 4% showed "severe atherosclerosis of aorta, including ulceration and calcification, but in which atherosclerosis of coronary arteries does not significantly diminish the lumen": at the same time 2% of coronary arteries showed "marked atherosclerosis"; mortality from coronary disease was 0·55%. In the investigation of Laurie and Woods,[1] 16% of the 300 aortas examined showed "severe atherosclerosis with ulceration, calcification, and gross scarring"; the state of the coronary vessels was not recorded; not one subject was mentioned as dying from coronary occlusion, not even in the larger series mentioned of 2000 consecutive necropsies. Strangely, this finding evoked no comment.

The main purpose of this letter is to stress this disparity in the Bantu between the occasionally severe atherosclerosis of aorta, although to a lesser extent of coronary vessels, and the low mortality from coronary occlusion.

Even in Dr. Davies' extensive postmortem studies in Uganda, where mortality from occlusion is virtually non-existent, he stated: "At Mulago a very high proportion of Africans coming to autopsy over the age of 50 show marked atheromatous lesions.[6]" If thickening, ulceration, calcification, &c., arise largely from a succession of thrombotic episodes, it is not easy to understand why progression of these episodes leading to occlusion and death does not occur more frequently in these people. Presumably, the "severe degree of coronary sclerosis" held by Lober [8] to be necessary, speaking generally, for symptoms and death, is not attained. The usual argument trotted out over the Bantu not living long enough to die from coronary thrombosis is untenable; in Johannesburg there are 60,000 Bantu over 45 years, and 9000 over 65 years. Using Professor Yudkin's phraseology,[12] *predisposing causes* in at least a proportion of the local Bantu are certainly present (atheroma, hypertension, stress, and smoking); against these range the pattern of their diet, infrequent obesity (except in women of 20 to 40), greater physical activity, and liver disease [7 13] (with combined ramifications in low serum-lipid components, high plasma-fibrinolysin activity,[13] &c.); the *precipitating causes* obviously are virtually absent.

1. Laurie, W., Woods, J. D. *Lancet*, 1958, i, 231.
2. *Epidem. vit. Stat. Rep*, 1956, **9**, 537.
3. *ibid.* 1957, **10**, 219.
4. Annual Report, Baragwanath Hospital, Johannesburg, 1951–55.
5. Annual Report, Johannesburg Public Health Department, 1956.
6. Davies, J. P. N. *E. Afr. med. J.* 1948, **25**, 454.
7. Walker, A. R. P. Conference on Hormones and Atherosclerosis, Brighton, Utah, U.S.A., March, 1958. To be published.
8. Lober, P. H. *Arch. Path.* 1953, **55**, 357.
9. *Brit. med. J.* 1955, ii, 1016.
10. Becker, B. J. P. *S. Afr. J. med. Sci.* 1946, **11**, 107.
11. Higginson, J., Pepler, P. J. *J. clin. Invest.* 1955, **33**, 1336.
12. Yudkin, J. *Lancet*, 1957, ii, 155.
13. Gillman, T., Naidoo, S. S., Hathorn, M. *ibid.* p. 696.

Professor McMichael considers that " strong emotional devotion to corn-oil diets or anticoagulant pills will do no good to medicine ". Prof. Ancel Keys,[14] possibly more colourfully, has derisively inveighed against those who entertain the view that the coronary-heart problem may be solved without retreating from present high-fat diets merely " by taking a daily swig of linoleic acid and a few vitamin pills ". We concur with these views. Mere attainment and maintenance of a " favourable " blood-lipid picture per se need not reduce the chance of dying from coronary-artery disease; we believe that for that " favourable " blood-lipid picture to be effective, directly or indirectly, it may well have to lie within a particular dietary and metabolic context. Although most writers regard it as premature to recommend significant changes in diet to ward off death from coronary occlusion, our belief is that the only certain known way to do this is by adoption of the pattern of diet (with all its concomitant metabolic ramifications) consumed by the Bantu and similar populations. For this viewpoint there is much evidence, published and unpublished, which one of us (A. R. P. W.) hopes to present in the near future. It would be naïve, however, not to recognise that the likelihood of any marked change occurring voluntarily in the diets of Western populations, no matter how frightening is the increasing mortality from coronary disease, is so remote as scarcely to merit serious discussion.

C.S.I.R. Human Biochemistry Research Unit, South African Institute for Medical Research, Johannesburg. ALEXANDER R. P. WALKER.

Baragwanath Hospital and South African Institute for Medical Research, Johannesburg. I. W. SIMSON.

NEW METHOD OF PHENOBARBITONE ADMINISTRATION

SIR,—I thank Dr. O'Connor (May 3) for his reply.

(1) I have accepted his facts and have said, giving reasons, that from them no conclusion can be drawn about the value of ' Spansule ' phenobarbitone. If its value was so great, why had other anti-convulsants to be simultaneously given, sometimes in increasing doses?

(2) The description of the rigid routine for administration of drugs, and the statement that the same nurses had attended the patients for a number of years, are new, though not very precise, data. They do not amount to the required guarantee, especially with patients who were spiteful, cunning, paranoid, hostile, and suspicious.

(3) There is a confusion here between improvement of personality, in which we all hope that psychotherapy has a great future, and relief from epilepsy, in which we all agree that it has not.

(4) Added interest and stimulation on the one hand, and increased medication on the other, are not mutually exclusive alternatives. I said, and meant, " may have helped ".

(5) " Either wholly or in part "—there's the rub.

(6) If 18 patients with, say, a hitherto invariably fatal disease were given a certain drug and all recovered, that number would be superfluously great for proof; but where everything is a matter of degree and careful assessment, 20 is nearly always the bare minimum. I did not mention inert substances; the comparison should be with the same dosage of ordinary phenobarbitone, as suggested by Dr. Pearson (April 19).

(7) " Striking " does not mean convincing. There is no conflict here. Kurtzke and Berlin's data were impressive except for two flaws: the control series, having been earlier than the treated series, was studied retrospectively; and in the treated series both patients and doctors knew who was receiving a new treatment. The parallel is close, and instructive to anyone who sees the same general difficulties in all therapeutic trials.

Dr. Levitt (May 10) seems to say that the paper is open to criticism but we ought not to criticise it. I agree with him that the method may be of great value; would he agree with me that equally it may not? That is what I mean when I say that no conclusion can be drawn from the present data. If I had thought that they should be ignored I should have ignored them instead of writing a letter about them.

Perhaps we may now all agree to await the results of a controlled clinical trial.

London, W.1. JOHN PENMAN.

14. Keys, A. *ibid.* 1956, i, 576.

THE Y CHROMOSOME IN MAN

SIR,—Both the true hermaphrodite and the man with the uterus referred to in my letter of May 3 have elastic tissue surrounding the hyalinised seminiferous tubules of their testes. This distinguishes them from Dr. Ferguson-Smith's latest description of chromatin-positive microrchidism (May 3, p. 928). It also alters the premises on which I based my argument on the function of the Y chromosome.

Department of Anatomy, The Medical School, King's College, Newcastle upon Tyne. JOHN GRAY.

" THESE DYING DISEASES "

SIR,—The paper by Mr. Ambrose King (March 29) concerning present-day problems of venereology was timely, especially in regard to gonorrhœa, in which there is the alarming situation of an increasing number of cases and an apparent lessening sensitivity of the gonococcus to penicillin.

The number of new male cases of gonorrhœa seen in the clinics of England and Wales has increased by approximately 28% during the last two years, and the current figure for both sexes is virtually the same as it was as far back as 1949. At the same time doses of repository penicillins, which were once 95% effective, today produce far less satisfactory results. Indeed, in recent series treated with single doses of 1·2 mega units of procaine penicillin with aluminium monostearate or of benzathine penicillin, failure-rates in the range of 18%–30% have been encountered.

While similar experiences have not so far been widely reported in the U.S.A., the situation is certainly not confined to Britain. At the recent World Health Organisation seminar in Tokyo it was evident that the declining powers of penicillin in gonorrhœa had been widely noted in the Far East. Indeed, in a " sex store " in Yokohama, where I asked the proprietor what he used for gonorrhœa (drug-store treatment being legal in Japan), I was informed that for some time he had employed the tetracycline antibiotics, because penicillin was no longer effective.

It is not known for certain whether the gonococcus is developing alternative metabolic processes or whether, as seems more likely, the apparent lessened sensitivity is arising from repeated selection of the more insensitive strains. Further research is required. In any event it seems that higher doses of shorter-acting penicillin preparations are required to provide higher peaks of penicillinæmia than are obtained with repository penicillins which the gonococcus now seems capable of overcoming. This would mean the sacrifice of the so-called " epidemiological tail " provided with repository penicillins which act during the time that the consorts are being traced and which reduce the possibilities of reinfection of the original patient, and at the same time help to reduce the reservoir of syphilis. " All-purpose " penicillins, by providing a higher initial level, and also a prolongation, at present give better results and might provide the answer, but, on the other hand,

the existence of the "tail" itself may foster further relative resistance of the gonococcus.

The treatment of gonorrhœa today presents a difficult problem and it was the consensus of opinion amongst participants at Tokyo that the deteriorating situation would tend to continue with increasing numbers of cases and further evidence of lessened sensitivity of the gonococcus to penicillin. There is certainly no place for complacency.

London, W.1. R. R. WILLCOX.

AN EOSINOPHIL COUNTING CHAMBER

SIR,—Ever since the assessment of pituitary and adrenocortical function began to attract increasing attention, there has been much controversy about eosinophil counting. New methods and techniques are proposed from time to time, but none seems to solve the problem. It seemed to me that it would be better to concentrate on finding out the reasons for the shortcomings of the well-known acetone methods, which are far superior in their clarity, rather than use fluids whose viscosity and colour make it hard to identify the cells. In spite of the meticulous care of analysts and statisticians, there is still something which confuses results when acetone diluents are used. Fractions of the same blood sample treated by the Dunger, Rud, or other methods, give contradictory results under identical conditions; and simple experiments showed that even fractions of the same mixture, led simultaneously through pipettes to chambers of various capacity, gave results differing by from 30% to 50%, as the volume of the chambers was increased.[1]

These findings suggested that the trouble lay in the way in which the cells sedimented in the chambers. I found that during sedimentation the peripheral cells were driven towards the centre of the chamber, where cells accumulated, thus seriously affecting the accuracy of the count. In all types of chambers, the periphery was depleted in this way when acetone was used. On the other hand, this phenomenon was not noted in chambers filled with blood and other hæmatological fluids not containing acetone.

It occurred to me that the cause of this migration (which is a phenomenon distinct from Poisson distribution) was the contact between air and acetone-containing fluid at the edges of the chamber, and I sought to overcome the difficulty by designing a chamber which would completely eliminate contact between drops and air during the counting.

In this chamber (figs. 1 and 2) a wall (W) surrounds the ruled area (R) and prevents the drop of fluid in the chamber from coming in contact with air. A support (S) holds the coverglass in contact with the drop. Fig. 3 shows how this chamber eliminates the migration which takes place in other types of chamber.

A rectangular ruling (8×5 mm.), in the Fuchs-Rosenthal pattern, gives large columns for easy reading. It is unnecessary to load the chamber more than once for any particular count. The ruling is divided into fourths by double median lines, thus permitting a count of half or quarter of the ruling in intense eosinophilia. The big volume of the chamber (10 c.mm.) means that the total count gives directly the number of cells per c.mm. of blood, using a dilution of 1 in 10. The shallowness of the chamber (0·25 mm.) overcomes the difficulty of sedimentation so common with deeper chambers. The walls are inclined so that no foreign bodies can stay in it when the chamber is being cleaned. Preparations can be left in the chamber almost indefinitely, and wet boxes are no longer needed. The cells can be coloured in the chamber proper, without risk of desiccation or removal of cells.

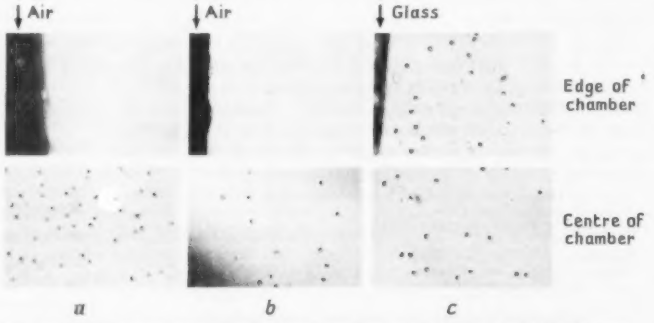

Fig. 3—Photomicrographs illustrating migration in (a) Jessen chamber (0·4 mm. depth) and (b) Fuchs-Rosenthal chamber (0·2 mm. depth), and absence of migration in (c) Boghrati chamber (0·25 mm. depth).

The distributors of the chamber are Evertex AB, 29, Stortorget, Malmo, Sweden.

New York. N. BOGHRATI.

1. Boghrati, N. *Brux. méd.* 1954, **34**, 1945, 1999.

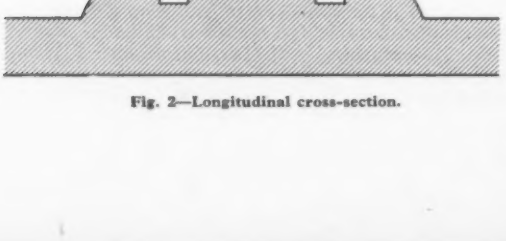

Fig. 1—Photograph of counting chamber.

Fig. 2—Longitudinal cross-section.

RETROLENTAL FIBROPLASIA

SIR,—Your recent suggestion (April 26, p. 893) to abandon the term "retrolental fibroplasia" and replace it by "oxygen-induced retinopathy of prematurity" may give rise to certain difficulties.

For the past four "oxygen-conscious" years we have continued to examine the ocular fundi of all infants in the premature nursery of Babies Hospital at weekly intervals. During this period there were 1060 admissions of infants whose birthweight was below 2000 g. Five individuals developed retrolental fibroplasia, a substantially reduced incidence of this distressing condition as compared with four previous years. Three of these infants had experienced only the briefest exposures (minutes) of supplementary oxygen and never in concentrations above 40%. The ocular disease in these infants was in no way different from that observed previously in our nursery in many infants following prolonged exposure to high concentrations of oxygen.

It is important to admit the possibility of the (rare) occurrence of retrolental fibroplasia as the result of exposure to only atmospheric concentration of oxygen (21%). An accurate history of "no supplemental oxygen" does not exclude the possibility of this disease. The term "oxygen-induced retinopathy of prematurity" may be technically correct and

does not exclude these rare examples that occur after exposure to 21% oxygen. I am concerned, however, that the use of this term will result in the erroneous exclusion of these cases in future reckonings because of misinterpretation of the limits of this category. Our best interests will not be served if retrolental fibroplasia is spuriously eradicated by a glossological manœuvre.

Babies Hospital, New York. WILLIAM A. SILVERMAN.

A FIFTH MALARIA PARASITE OF MAN?

SIR,—Kindly permit me to make the following observations with regard to your annotation [1] on this subject.

Sinton and Mulligan [2] made a successful transmission of *Plasmodium knowlesi* to a monkey with *Anopheles annularis* and not *A. maculipennis* as you stated.

The following report [3] regarding *P. knowlesi* as a human infection, published in 1952, is also of special interest, since it is based on an attempt at sporozoite-induced transmission, while the other reports, so far as we know, are based on trophozoite-induced transmissions:

"Differences in susceptibility of man to sporozoite- and trophozoite-induced infections of *P. knowlesi* are also known. Ray (personal communication in 1951) caused three batches of five specimens of *A. annularis* harbouring sporozoites of *P. knowlesi* to bite three human volunteers.* After biting the human volunteers, each mosquito was dissected and the residual sporozoites were inoculated into three monkeys all of which took the infection. Blood films of the volunteers were examined periodically and not one of them developed the infection in the course of ten months of observation. About the same period, two white mice were inoculated each with two mosquito equivalents of *P. knowlesi* sporozoites, and no infection could be detected in them during two months when their blood smears were examined daily. Man, as already stated, is susceptible to blood-induced infections of *P. knowlesi* but not to sporozoites. White mice on the other hand are not susceptible either to sporozoite- or blood-induced infections of *P. knowlesi*."

There is a mistake in reference 12: the name of one of the joint authors is Nair and not Mair.

Malaria Institute of Delhi, India. S. P. RAMAKRISHNAN Deputy Director.

*** We are grateful to Dr. Ramakrishnan for pointing out our two mistakes.—ED. L.

DEATH OF A BOXER

SIR,—Having spent most of my active sporting life in the ring, I feel I should understand both the physiological stresses and the pathological lesions of the art of self-defence. I was lucky in having a precisely developed postman's knockout punch to win six Irish university titles (1924–29), three British university titles (1927–30), and the heavyweight title of the R.N.V.R. (1931)—all on knockouts. None of my opponents ever suffered from any after-effects, and in all my close contact with boxing over thirty-five years I have never seen any permanent lesions caused by it. This great British game teaches a man to stand up and face both physical and moral stresses, which in my own eventful career has stood me well.

I foster and admire the noble art, and in this town we have one of the finest boxing clubs in Kent.

Of course there are inherent dangers in all sport, as in life in general; but under proper medical supervision and the rules of the A.B.A. and the B.B.B.C., character, the British bulldog breed, and fair play are fostered.

Tunbridge Wells. E. F. ST. J. LYBURN.

1. *Lancet*, 1957, ii, 932.
2. Sinton, J. A., Mulligan, H. W. *Rec. Malar. Surv. India*, 1933, **3**, 381.
3. Prakash, Satya, Krishnaswami, A. K., Ramakrishnan, S. P. *Indian J. Malar.* 1952, **6**, 179.

* "One of the volunteers had never experienced any malarial infection at any time while the other two had malaria prior to 1943, 8 years previously, and underwent a radical cure."

TREATMENT OF ASTHMA AND HAYFEVER BY HYPNOSIS

SIR,—This correspondence seems to provide data for an observation in what is probably the realm of social psychology or even anthropology: three out of five of your correspondents have either not read the original paper with any attention, or have failed to understand it. Dr. Moynahan (May 17) might not admit this sample of professional men as statistically significant, but we feel that such a finding of 60% among even a single group is unlikely to be without cause. As one possible interpretation we would point out the emotional affect still apparently engendered by the word "hypnotism"—much as it was by "mesmerism" in the days of Lavoisier, recalled in Dr. Moynahan's letter—and the suspicion, or even distortion, of the facts, which such affect can produce in an observer.

Our object in carrying out the experiment was quite clearly stated in the opening paragraph: noting, with references, the value of hypnosis as a means of symptom relief (not cure) in allergic conditions, we then told how we "tested a patient's skin reactions to known allergens during the relief of associated allergic symptoms by hypnosis"—and we recorded our results. While endorsing Dr. Moynahan's views on the education of present-day medical students in statistics and probability theory, we do not, however, believe that all experimental results are necessarily dependent on statistical analysis—although we admit, incidentally, it often seems that almost any result can be obtained (or refuted) by statistics.

In our paper, therefore, we made no "therapeutic claims based on a solitary case" (Dr. Moynahan); "good evidence . . . of the value of hypnosis" (Dr. Franklin, May 17) was not presented, since this was taken as read; and we never denied in any way that "individual case-histories can readily be matched . . . from patients treated by either psychological or allergic methods." (Dr. Pepys, May 10). Dr. Pepys, in fact, was so busy submitting our report to "critical analysis" that he wrote of the ". . . repeated vigorous skin testing. (10 pricks were made into each site compared with the one prick commonly used for diagnosis.)" From this he then proceeded to draw a whole series of conclusions. The method used, however, was not the "prick test" at all, but the less traumatic and less desensitising technique of "multiple pressure", with which the other was carefully compared at the outset. Describing our actual tests we wrote: "Multiple pressure through the drop was then exerted ten times, without scratching, with a sterile hypodermic needle."

Dr. Pepys also suggested that "the inhibition by hypnotic suggestion of a single test on the left leg performed immediately on waking from a deep hypnotic trance, could be attributed to the well-known modification of peripheral circulation by hypnosis". This, of course, is possible, but if Dr. Pepys consults table I of our paper, he will be able to count no less than 16 positive urticarial reactions recorded as a result of skin testing immediately "on waking from a deep hypnotic trance". On the one occasion, however, when direct suggestion was made that all skin reactions should be inhibited, there was no reaction on the left leg after testing—and we took this to be significant.

The problem of possible local hyposensitisation raised by Dr. Pepys and subsequently by Dr. Blair Macaulay (May 17) is of more interest and presents one of the inherent difficulties in designing experiments in this field: as does the possible development of an anaphylactoid response when working with other materials.

In general it will be found that different parts of the body give different degrees of allergic response to the same allergen when tested at the same time, but that the same part of the

body tends to give approximately the same degree of reaction when tested over a period of time. Tests on different parts of the body to avoid the possibility of local hyposensitisation would therefore be unsuitable for comparison and the results of the experiment meaningless. Comparable tests were therefore carried out on the left forearm—though not exactly on the same spot each time—and the " prick test, the modified prick test, the scratch test, and the intradermal test " were all rejected in favour of multiple pressure, in the hope of minimising local hyposensitisation. As it turned out this approach was reasonably successful. According to the notes the patient in this case was seen on July 22, 1957, when her personal " hayfever season " was over and her full skin sensitivity was returned to her by direct suggestion under hypnosis. Tested after waking on the left forearm, the responses were recorded on ' Sellotape ' in the usual way and stuck in the notes, though the actual areas have not been calculated by lead tracing and weighing. They appear, however, to be approximately equal to those recorded during the third week of treatment, when the figures were: B2, 139 sq. mm.; B3, 33 sq. mm.; and B8, 25 sq. mm. We apologise for not including these facts in our report.

In this and further experiments on which we have worked, or are now engaged, hypnosis as such is not under investigation as a therapeutic agent, as Dr. Moynahan and others seem to have assumed. It is either being used incidentally for treatment in routine psychiatric practice (as in the case recorded), or we are employing it as a tool with which to manipulate psychosomatic and other phenomena in suitable volunteer hypnotic subjects. Under investigation in both these cases are the physiological and serological changes influenced by hypnosis, and these occur particularly in association with conditions generally described as " allergies ". von Pirquet [1] coined this term " allergy " as descriptive of " an acquired alteration in the capacity of living tissues to react " with specific reference to " old tuberculin " in sensitised subjects. We have also investigated the psychic element involved in this, " the original allergy ". Pace Dr. Pepys (of the Tuberculosis Research Unit), we will shortly be publishing a paper which records the inhibition of a positive Mantoux reaction by means of suggestion under deep hypnosis: thereby producing an individual Mantoux-positive in the left arm, and Mantoux-negative in the right. At a subsequent session, this state of affairs was reversed, and the subject became Mantoux-positive in the right arm and negative in the left.

We wish to thank your correspondents for their interest in our work.

West London Hospital, London, W.6. A. A. MASON STEPHEN BLACK.

INTERMITTENT ALDOSTERONISM IN PERIODIC PARALYSIS

SIR,—We have read with much interest the article by Conn et al. on periodic paralysis.[2]

The principle of the salt-restricted diet, advocated in this study, has been applied to two patients with periodic paralysis. We have not been able to confirm the hopeful results claimed by Conn et al.

In one patient, who had severe paralytic attacks at least once a week, neither a diet containing 20 (or even 10) mEq. of sodium daily, nor the combination with desalting procedures, prevented the recurrence of these spontaneous attacks.

In his sister, who had a mild form of the disease, the administration of glucose and insulin, which provoked an attack on a normal salt intake, did not result in an attack when a salt-restricted diet was given. It seems as if the effect of the salt-restricted diet depends on the severity of the disease.

We have been able to confirm the retention of sodium (and of chloride) during the attacks. This did not, however, precede clearly the retention of potassium and did not seem to be essential for the occurrence of an attack.

Department of Endocrinology and Metabolic Diseases, University Hospital, Leiden, Holland. J. DE GRAEFF J. S. H. BROCKER.

EXTRACORPOREAL CIRCULATION

SIR,—I was much interested by your leader of May 17. I feel sure that many of us feel guilty in not having supported Professor Ian Aird and his team at the Postgraduate Medical School more wholeheartedly. It is good to see the Postgraduate machine coming into its own.

In Birmingham, we use the Lillehei-DeWall system and find its application to human patients admirable and it has entered the hospital routine. In the last paragraph of your leader you mention that the main charge should fall henceforth on the National Health Service, and I do hope this advice will be heeded. The establishment of a working heart-lung bypass apparatus in this hospital has been possible only because of a generous grant from the Endowment Research Fund, supported by one from the University of Birmingham.

During the last year a team, always the same in personnel, has been working regularly and continuously in the laboratory. Four medical members of the team and two whole-time technicians have mastered the techniques, and the same team is now operating in the hospital theatres. Such a transition is expensive and as soon as it is taken over by the hospital authorities a financial allocation will be necessary for the continuance of the work, which is now long beyond the experimental stage.

Birmingham. A. L. D'ABREU.

AMERICAN REACTIONS TO THE STAPHYLOCOCCUS

SIR,—Your enlightened editorial of May 17 contains the seeds of progress, in the phrase " . . . nobody has power to act ". The general establishment of the post of hospital infection officer is merely another sop to the sleeping Cerberus, unless " . . . he has power to act ". Action is what is needed.

An account of a successful eight-year effort to keep a well-known maternity hospital free of infection was recently refused publication, probably because it contained too much boring detail. If this detail is too boring to *read*, how much more boring it must be to *effect* in actual practice; unless one judges rather by results than by the deadly day-to-day routine.

New lamps for old is still the cry; but Aladdin knows his literature, and clings to his ancient source of enlightenment. The matrons still hopefully polish the lamp of Florence Nightingale . . . but the genie eludes them. Anyway, we have it on very good authority that Florence Nightingale did not believe in bacteriology [1]—or faeries either, probably.

What is really needed is the atmosphere described so effectively by a very great and gracious Lady recently in Liverpool [2]: she said, " Visitors are conscious of a pulse like a hammer and a vigour which nothing can daunt."

St. Margaret's Hospital, Epping, Essex. FRANK MARSH.

1. von Pirquet, C. F. *Berl. klin. Wschr.* 1907, **48**, 644, 699; *J. Amer. med. Ass.* 1909, **52**, 675.
2. Conn, J. W., Louis, L. H., Fajans, S. S., Streeten, D. H. P., Johnson, R. D. *Lancet*, 1957, *i*, 802.

1. Cope, Z. Florence Nightingale and the Doctors. London, 1958.
2. See *Lancet*, May 17, 1958, p. 1067.

TOXÆMIA OF PREGNANCY

SIR,—Professor Theobald (May 10) asks me three questions. First he says:

"Infants, non-pregnant women, and men die from renal cortical necrosis. If toxæmia of pregnancy results from cortical ischæmia, why is eclampsia peculiar to the pregnant state?"

Briefly the answer to this is that in pregnant women (but not in infants, non-pregnant women, or men) cortical ischæmia is associated with retention of salt and water.

Secondly, he asks why—if resistance to uterine stretch is the stimulus which provokes renal ischæmia—bilateral cortical necrosis practically never occurs in primigravidæ but is commonest in multigravidæ with accidental hæmorrhage. The reason is that the extreme bursting force resulting from a concealed accidental hæmorrhage causes the extreme degree of renal shut-down that is characteristic of cortical necrosis.

Thirdly, he asks how it is that patients with true eclampsia may secrete urine freely. For this there may be several reasons:

(1) Preceding attempts at treatment (e.g., intravenous glucose) may have provoked an osmotic diuresis.

(2) Drugs such as veratrone and apresoline may have reduced the vascular resistance.

(3) Restriction of salt may have caused diuresis, as it does in the presence of œdema.

Diuresis is not, as might appear, incompatible with renal cortical ischæmia. On the other hand, of course, a mounting oliguria is usual with impending eclampsia.

London, W.1. JOHN SOPHIAN.

VISITING PARENTS IN HOSPITAL

SIR,—Florence Nightingale in her *Notes on Nursing* (1859) wrote:

"There is no better society than babies and sick people for one another. Of course you must manage this so that neither shall suffer from it, which is perfectly possible. If you think the 'air of the sick room' bad for the baby, why it is bad for the invalid too and therefore, you will of course correct it for both. It freshens up a sick person's whole mind to see 'the baby'. And a very young child, if unspoiled, will generally adapt itself wonderfully to the ways of a sick person, if the time they spend together is not too long."

Professor Illingworth's plea (May 10) is timely. The struggle to achieve daily visiting to children in hospital was hard but the results justified the endeavour.

One of the next steps in the "humanisation" of our hospitals is the provision for ill parents to have their children visit them. The same arguments used against daily visiting, namely the spread of infection and the subsequent emotional upset to the child, prove in practice to be quite unfounded.

London, W.1. DAVID MORRIS.

SIR,—I would support Professor Illingworth's plea for allowing children to visit their ill parents in adult wards.

For the past two years we have allowed the children to visit all wards, other than obstetric or tuberculous, for half an hour on Saturday afternoons. The ward sisters agree that, on balance, it is a good thing and much appreciated by their patients.

There are difficulties. It is not easy to limit the number of visitors at any bedside to two. All the children have to come visiting, since it is often not possible to arrange for the care of any left at home.

Very occasionally a child has been upset by seeing some hospital activity—e.g. a blood-transfusion in operation. Again, a noisy baby can be disturbing to an ill patient. Nevertheless, a good ward sister can deal with these minor troubles, and we should not wish to deprive the adult patients of these weekly family gatherings.

Whittington Hospital,
St. Mary's Wing,
London, N.19. CECIL D. COYLE.

BONE-MARROW TRANSPLANTS

SIR,—The recent fundamental work on immunological tolerance and bone-marrow transplantation in animals was expected to lead to an outpouring of reports on its clinical application. Only one major clinical study, however, has been published to our knowledge—that of Thomas et al.[1] The reason for this reticence is probably the lack of convincing evidence of clinical success or failure.

The recent preliminary communication of Dr. Humble and Dr. Newton (Jan. 18), who have used the intra-aortic route of injection, has not contributed essentially to the clarification of this problem. It is unlikely that the intra-arterial injection of a marrow suspension would be more successful than the intravenous route, which has been found to be effective in mice and to a limited extent in man.[1] The avoidance of removal of cells by the lung and the closeness of the bone-marrow area to be repopulated by the graft do not appear to be factors of sufficient importance to warrant the risk of intra-arterial catheterisation. In the past, successful direct injection of a bone-marrow suspension into a marrow cavity has never been reported. Nevertheless, such preliminary reports as the one by Dr. Humble and Dr. Newton are apt to stimulate clinical interest in a procedure which will undoubtedly become increasingly important.

Our experience with a patient in whom bone-marrow transplantation was attempted as a desperate measure may be of interest.

A 36-year-old man with Hodgkin's disease of two years' duration had previously been treated with X-irradiation to the mediastinum and nitrogen mustard. After ten months' remission, enlarged nodes developed in both axillæ and supraclavicular fossæ, associated with malaise, weight loss, and slight fever. He was treated with a total dose of 15 mg. of tretamine (T.E.M.) over ten days, and two weeks after the last dose was found to have severe purpura caused by aplasia of the bone-marrow (Hb 7 g. per 100 ml., white cells 500 per c.mm., platelets 11,000 per c.mm., bleeding-time > one hour). Bone-marrow aspiration from three sites revealed empty spicules with only histiocytic elements. Three pints of fresh blood was transfused and prednisone was started at a dose of 100 mg. daily, which was later gradually reduced. He improved symptomatically, but a week later only the hæmoglobin value had risen (to 10 g. per 100 ml.), and there had been no change in the character of the bone-marrow, the agranulocytosis, and the thrombocytopenia.

It was decided to attempt a bone-marrow transplant. For the purpose of follow-up, the genotypical blood-group combination of the patient had to be determined, but because of the preceding transfusions this had to be done by examination of the parents, who fortunately were available. The patient's genotype was O, M, CDe/cDe. Bone-marrow samples were obtained under operating-room conditions from four suitable volunteers; the fat was removed and the bone particles filtered out with a Swinny filter syringe. The pooled sample was suspended in Tullis solution and injected intravenously. About 3×10^8 nucleated cells were injected. Four donors were

1. Thomas, E. D., Lochte, H. L., Jr., Wan Ching Lu, Ferrebee, J. W. *New Engl. J. Med.* 1957, **257**, 491.

N-positive and two donors E-positive. (N and E erythrocytes, therefore, were suitable for survival studies in the recipient.) Treatment with prednisone (40 mg. daily) was continued. Three days after the transplant, white cells were 4500 per c.mm., with 75% polymorphs; and six days later, the platelet-count was 109,000 per c.mm. The reticulocytes started to increase (4·2%, red cells $4·5 \times 10^6$ per c.mm.).

Periodic bone-marrow examination revealed evidence of gradual recovery. At present, seven months after the transplant and three months after the prednisone was stopped, hæmopoiesis appears to be normal, the nodes are no longer palpable, and the Hodgkin's disease appears to be in remission. Weekly examination of the blood-group pattern, by the technique of differential agglutination,[2] with the N and E erythrocytes used as "markers", revealed a concentration of 50–56% N cells and 30–40% E cells, maintained for ninety days after the transplant and ninety-eight days after the transfusion. Thereafter, the concentration declined, and a hundred and forty days later such cells could no longer be demonstrated.

Unfortunately, because of the previous blood-transfusions, this cannot be considered absolute proof of a successful transplant. Nevertheless, the possibility cannot be discarded that the graft was temporarily accepted and later rejected after the patient's bone-marrow started to recover, perhaps under the influence of prednisone. Whatever the mechanism, the rapidity of recovery of this patient from tretamine-induced aplastic anæmia makes it likely that the injection of bone-marrow cells from four donors contributed to it.

Veterans Administration,
Westside Hospital,
Chicago, Illinois.

PAUL HELLER
VINCENT YAKULIS.

CATARACT: A BIOCHEMICAL PROBLEM

SIR,—It was rightly pointed out in your annotation, Prospects in the Prevention of Blindness (March 15, p. 577), that cataract is not a "senile" affection and that its nature is still unknown. However, it was quite out of keeping with the theme being developed to end by placing in opposition the "one major surgical problem"—cataract—and all the other causes of blindness, classed as medical.

One of the greatest hopes for the prevention of blindness lies in the elucidating of the biochemical changes which the lens undergoes during ageing and cataract formation, and it is to be hoped that before very long this important and widely prevalent condition will be removed altogether from the sphere of the surgeon.

East African Institute for Medical Research,
Mwanza, Tanganyika.

D. S. MCLAREN.

PAROXYSMAL NOCTURNAL HÆMOGLOBINURIA

SIR,—Dr. Stratton and his colleagues (April 19) describe three cases of paroxysmal nocturnal hæmoglobinuria (P.N.H.) in which severe hæmoglobinuria was stopped by infusion of clinical dextran.

Some years ago, Crosby [3] stated that anticoagulants (especially heparin injections) lower the rate of hæmolysis "in vivo". But he repeatedly observed severe hæmolysis on cessation of heparin activity (referred to by him as "biphasic action"). Thus he and many other authors warned against the use of heparin in P.N.H. cases.

During the last four years we have had the opportunity to treat 3 cases of P.N.H. with heparin. It was administered as an infusion, diluted in physiological saline in doses of 30,000–50,000 units per day. Hæmolysis was immediately stopped. It was even possible to carry out transfusions of whole blood during these infusions. Furthermore, cessation of heparin activity was not followed by hæmolysis.

Heparin infusion therapy was first published by us in 1955.[4] Further details of the above treatment will be published in the German medical weekly *Klinische Wochenschrift*.

H. G. LASCH
A. LINKE
H. H. SESSNER
A. VÖLKER.

Medizinische Universitäts-Klinik,
Heidelberg, Germany.

TETANUS

SIR,—As your leader of May 10 suggests, the value of relaxants in the treatment of severe tetanus is still not accepted by all who treat this disease, but I am convinced that the number of reports of such patients recovering with relaxants will continue to grow. I shall be publishing in due course details of two further cases recently treated successfully with succinylcholine and intermittent positive-pressure respiration (I.P.P.R.). These two patients had incubation periods of 8 and (apparently) 3 days, and periods of onset to major convulsions of 36 and 48 hours respectively.

In the severe cases necessitating tracheotomy and relaxant drugs, respiratory paralysis must be produced and artificial respiration given with I.P.P.R. There is no advantage and considerable danger in trying to maintain a patient with sufficient relaxants to control the worst convulsions and not enough to depress respiration. The care of this type of case throws a heavy burden on general hospital wards and I would make a plea for all such cases to be nursed in respiratory units when there is such a unit near at hand. In a respiratory unit single cubicles are readily available and the management of I.P.P.R. is part of the normal routine.

St. Ann's General Hospital,
London, N.15.

G. DONALD W. MCKENDRICK.

IDENTITY DISCS FOR MEDICAL INFORMATION

SIR,—Although Dr. Scott's generalisation (May 17, p. 1069) that "considerable sections" of the civil population are actively immune to tetanus may sound, perhaps, overoptimistic, the fact remains that a not negligible number of immunised persons may be found amongst injured patients receiving attention in casualty departments. As he so rightly states, there is much to be gained by ensuring that these people are given a booster dose of toxoid rather than an injection of A.T.S. (Indeed, when there is incontrovertible proof of adequate immunisation in the recent past, even the booster may safely be omitted.)

Unfortunately many of them (e.g., young children, brought in from street accidents, unaccompanied by adult relatives) either cannot say anything about previous immunisation or give information which the casualty officer regards as of doubtful reliability. In either case he tends to play for safety by administering A.T.S.

The difficulty lies in ensuring that dependable evidence of previous immunisation shall always be available in times of emergency. Record cards given to immunised persons, though important, do not appear to solve the problem; all too often the card is not at hand when most needed. In a well-dragooned autocracy such information could doubtless be conveniently recorded by tattoo marks on the individuals concerned, but I imagine that few people in this country would take kindly to such a suggestion.

One possible solution would be a return to the old wartime identity disc, worn on a bracelet or necklace. A simple, but

2. Dacie, J. V., Mollison, P. L. *Lancet*, 1943, i, 550.
3. Crosby, W. H. *Blood*, 1953, **8**, 769.
4. Lasch, H. G., Linke, A., Sessner, H. H. *Acta hæmat. (Basel)*, 1955, **13**, 366.

universally understood code could be devised whereby a great deal of information about a person's medical history could be packed into very small compass on the reverse side of an identity disc. Items, other than the dates of toxoid injections, which might well be incorporated in the code are the individual's blood-group and warnings about such diseases as diabetes, epilepsy, hæmophilia, and allergy from which he might be known to suffer.

To be effective the scheme would need to be organised on, at least, a national basis. But better still would be an internationally agreed code-scheme. With the increasing prevalence of international travel, the World Health Organisation might investigate the possibilities of some such scheme.

Barking Hospital,
Barking, Essex. T. F. ELIAS-JONES.

SERUM-TRANSAMINASE ACTIVITY

SIR,—In a description [1] of a method for the estimation of serum-glutamic-oxalacetic-transaminase (GO-T) and glutamic-pyruvic-transaminase (GP-T), a provisional normal range was given for the units defined therein. The serum-transaminase activity of 75 "normal" adults of both sexes has now been estimated by this method, and the statistical analysis of these results is shown in table I.

TABLE I—SERUM-TRANSAMINASE ACTIVITY (UNITS)

—	—	Range	Arithmetic mean	Standard deviation	Statistical normal range (m ± 2σ)
GO-T	Men	35–107	70·43	±18·32	34–107
	Women	28–113	67·04	±16·54	34–98
	Total	28–113	68·73	±17·47	34–104
GP-T	Men	27–105	53·95	±20·25	13–95
	Women	17–92	47·95	±17·61	12–83
	Total	17–105	50·63	±19·21	12–89
GP-T / GO-T	Men	0·32–1·22	0·77	±0·19	0·39–1·15
	Women	0·24–1·15	0·72	± 0·24	0·24–1·20
	Total	0·24–1·22	0·75	± 0·22	0·31–1·19

No variation with age was noted. The distribution curve, as found in other enzyme assays,[2] was slightly skewed to the right giving a "lognormal" type of curve.[3] With such an assymmetric distribution it is impossible to define a normal range in terms of mean and standard deviation, and table II gives lower and upper 1% levels and lower and upper 10% levels.[2 4] 80% of the distribution is enclosed by the latter figures and 98% of the distribution by the former; results falling outside the 1% levels may be regarded as abnormal.

TABLE II—RANGE OF NORMAL SERUM-TRANSAMINASE ACTIVITY (UNITS)

—	Lower 1%	Lower 10%	Upper 10%	Upper 1%
GO-T	35	42	95	107
GP-T	22	28	78	92
GP-T / GO-T	0·28	0·42	1·00	1·12

Using the unit proposed [1] (namely, that which will transform 1μ mole of α-aminoacid to 1μ mole of α-ketoacid in one hour at 37°C under the conditions described), and expressing activity per 100 ml. of serum as in tables I and II, we have assayed both transaminases in various pathological conditions and determined their ratio $\frac{(GP\text{-}T)}{(GO\text{-}T)}$. The ratio has been found useful, being within normal limits in cases of uncomplicated myocardial infarction and usually elevated in hepatic dysfunction. The value of the determination in pulmonary tuberculosis, where levels are raised, is being studied, and its use is being investigated in the differential diagnosis of rheumatoid arthritis and rheumatic fever, where low and raised levels respectively have been found.

Further details of these investigations will be published later.

Darlington Memorial Hospital,
Darlington, Co. Durham. R. ANTEBI.
Group Pathology Department,
Barrow-in-Furness, Lancs. J. KING.

1. King, J. *J. med. Lab. Tech.* 1958, **15**, 17.
2. Wootton, I. D. P., King, E. J., Maclean Smith, J. *Brit. med. Bull.* 1951, **7**, 307.
3. Gaddum, J. H. *Nature, Lond.*, 1945, **156**, 463.
4. Wootton, I. D. P., King, E. J. *Lancet*, 1953, **i**, 470.

UNILATERAL NEPHRECTOMY: PREOPERATIVE TREATMENT OF HYPERTENSION

SIR,—Removal of a phæochromocytoma and unilateral nephrectomy are now standard operations for the relief of severe hypertension in appropriate cases. The patient's life may, however, be jeopardised after otherwise successful surgery by the damaging effect on the kidneys, or remaining kidney, of the postoperative drop of blood-pressure. This results in oliguria and may proceed to irreversible uræmia. It should be stressed that the post-operative blood-pressure level at which this complication may occur is higher in a severely hypertensive than in a previously normotensive patient.

It would, therefore, seem rational in these cases with sustained preoperative hypertension to precede operation by 3–4 weeks of medical treatment with ganglion-blocking agents, resulting in a gradual drop of blood-pressure. During this period the necessary vascular adaptations may slowly take place in the kidneys and brain, with a much smaller risk of infarcting these organs. This is never far removed when the blood-pressure is suddenly lowered drastically from any cause in elderly or severely hypertensive subjects.

Sheffield Royal Infirmary. H. J. GOLDSMITH.

FRACTURES OF THE PARIETAL BONE IN CHILDREN

SIR,—Mr. Maurice Ellis is incorrect in thinking that superficial collections of cerebrospinal fluid associated with linear fractures of the parietal region have not previously been reported. The condition is clearly described, and indeed illustrated, in the first edition of Rowbotham's *Acute Injuries of the Head*. Mr. Rowbotham calls them traumatic meningoceles—a clear and descriptive term—and stresses their common occurrence in children owing to the relatively adherent dura in young people.

I have encountered a number of cases, but the outcome has not always been as happy as in those described by Mr. Ellis.

In 2 the swelling has persisted and the underlying bone has been gradually absorbed so that a linear crack in the skull vault has become converted, over a period of six months or so, into an irregular oval defect in the skull. Rowbotham also describes and illustrates this event, referring to it as malacia of the underlying bone and noting that at a later stage brain may also herniate through the skull defect. It is because of this possibility that I believe that early dural repair is advisable. A small bone flap is turned down over the affected area and the dural defect is repaired either by simple suture or fascial graft. The torn dura is usually found firmly adherent to the bone and trapped in the fracture line.

In a further instance a similar skull defect appeared at the site of a linear fracture although swelling beneath the scalp had subsided within a few days of injury.

I feel, therefore, that dural repair is indicated in all these cases or, in default of such repair, careful radiological follow-up for at least a year.

Department of Neurosurgery, University of Birmingham. BRODIE HUGHES.

SIR,—Mr. Ellis describes a condition which is well known to neurosurgeons and those whose business it is to care for patients suffering from injury to the head. It is commonly termed traumatic meningocele.[1]

While it is usually found in children, it is also seen in adults. There is no reason why it should be confined to the parietal region, and it does in fact occur in other positions over the skull. I have also seen it occur over a fractured sacrum.

Swansea. NORMAN WHALLEY.

PARADOXICAL ELECTROCARDIOGRAM IN CORONARY EXERCISE TEST

SIR,—Dr. Geoffrey Bourne's report [2] on the change of an ischæmic T wave to a normal pattern after exercise prompts me to report two experiences.

Several years ago I was shown a series of electrocardiograms of a patient with raised S–T segments, typical of recent infarction; the tracing became normal after an inhalation of 90% nitrogen. Perhaps I should add that I understand that the patient suffered no ill effects from this myocardial assault.

My own experience concerns a 40-year-old lady referred to me by Dr. James Power. A rather routine cardiogram done in January, 1957, revealed flattened or inverted T waves in all leads; there was no clinical evidence of myxœdema, Addison's disease, coronary disease, or old pericarditis, and the patient was thought to be suffering from mild neurasthenia. A further tracing done in August showed a like record, and an exercise-tolerance test demonstrated a normal electrocardiogram with upright T waves in all leads. (All records were taken in a semi-recumbent position.) I am at a loss to account for the cardiographic changes in my patient.

Portiuncula Hospital, Ballinasloe, Co. Galway. MORGAN MCELLIGOTT.

LEVEL AND STABILITY OF BLOOD-GLUTATHIONE AFTER SPLENECTOMY

SIR,—The presence of Heinz bodies in erythrocytes of about 55% of patients after splenectomy was reported in 1955 by Selwyn,[3] who also put forward evidence that phenacetin could be responsible for their appearance in some cases. Recent investigations of favism and hæmolytic anæmias induced by several drugs (primaquine, sulphonamides, *p*-aminosalicylic acid, naphthalene) proved that these conditions, in which Heinz bodies also appear, arise in people with an intrinsic hereditary abnormality of erythrocytes.

This abnormality is manifested by defective activity of glucose-6-phosphate dehydrogenase, and low unstable blood-glutathione (G.S.H.), and defective incorporation of glycine into the G.S.H.[4–9]

Heinz bodies have also been reported in hæmolytic anæmia of the newborn after administration of vitamin-K analogues.[10] Zinkham and Childs [7] found a transient non-hereditary blood-glutathione instability in all the newborns so far studied.[7] The latter is not connected with deficient activity of glucose-6-phosphate dehydrogenase, and may be corrected in vitro by addition of glucose or inosin to the blood.[9]

In view of these recent developments, we thought it interesting to investigate whether the appearance of Heinz bodies after splenectomy was also connected with some glutathione abnormality.

Another reason for interest in the blood-glutathione after splenectomy was the possibility that it might be influenced by a change in the erythrocyte population following the removal of the spleen (e.g., increased number of target cells and total erythrocyte-count in thalassæmia after splenectomy [11]).

We examined the G.S.H. level and its stability in 16 patients, six months to four years after splenectomy, by the method of Beutler.[4] The patients were Ashkenasian Jews originating from Eastern or Central Europe (9 cases), and Sephardic Jews from Iraq (4), Persia (1), and Yemen (2).

In 14 cases the glutathione was stable and its concentration within normal limits. The mean G.S.H. content was $68 \pm 12{\cdot}4$ mg. per 100 ml. erythrocytes (in 300 control cases mean G.S.H. was $70 \pm 13{\cdot}4$ mg. per ml. 100). In the erythrocytes of 2 of these patients (women of East European origin) occasional Heinz bodies were found.

In 2 patients (men of Iraqi and Persian origin) the G.S.H. was low (27 mg. and 40 mg. per 100 ml. erythrocytes) and unstable. Its content fell to 6 and 3 mg. per 100 ml. as a result of incubation with acetyl phenylhydrazine. Few Heinz bodies were found in the blood of 1 of these patients, while in the 2nd they were seen in about 1% of erythrocytes.

In view of these findings we think that splenectomy does not cause blood-glutathione abnormality. This conclusion is probably not contradicted by the finding of the G.S.H. instability in the last 2 patients, because we have previously found this defect of erythrocytes in about 20% of Jews originating from Iraq or Persia.[9]

ARYEH SZEINBERG
CHAIM SHEBA
AVINOAM ADAM.

Government Hospital, Tel-Hashomer, Israel.

1. Rowbotham, G. F. Acute Injuries of the Head; 2nd ed., p. 51. Edinburgh, 1945.
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3. Selwyn, J. G. *Brit. J. Hæmat.* 1955, **1**, 173.
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Medicine and the Law

A Conviction for Unlawful Killing

AT the Central Criminal Court on May 19,[12] Dr. Louis Aimee Newton was found guilty of unlawfully using an instrument with intent to procure the miscarriage of a 35-year-old Australian nurse on Oct. 11, 1957, and of unlawfully killing her by using an instrument. Mr. Justice Ashworth passed sentence of two years' imprisonment on the first conviction and three years on the second. Dr. Newton was found not guilty of manslaughter on the ground of professional negligence.

According to prosecuting counsel, the nurse had consulted a psychiatrist, Dr. Ellis Stungo, who had advised abortion because of her state of mind. Dr. Stungo communicated with Dr. Newton, who carried out the operation for a fee of £75. After the operation he saw her to a taxi which took her back to her hotel. The patient died in hospital two weeks later, and death was attributed to renal failure following abortion.

Dr. Stungo was charged with counselling and procuring Dr. Newton to unlawfully use an instrument, but at the close of the evidence for the prosecution [13] defending counsel successfully pleaded that there was no case to answer and Dr. Stungo was discharged.

In evidence, Dr. Newton said that he visited the patient at her hotel after the operation and he found her pulse and temperature normal, though she said she felt sick. He thought she was making a slow recovery and in his judgment she was not sufficiently ill to get disturbed about. He admitted that he

12. *Times*, May 20, 1958.
13. *ibid.* May 16.

was wrong in his diagnosis in the first place, but he denied that he was grossly or criminally negligent in his treatment.

Dr. R. A. Brews said [14] he was familiar with the preparation used to procure the abortion, but he would not himself use it for this purpose. The proper place for an operation of this kind was in hospital or in a properly equipped nursing-home. Prof. J. C. McClure Browne said [15] that, having heard Dr. Newton describe the operation, he thought his technique perfectly reasonable. It was very difficult in the early stages, in this particular situation, to recognise anuria and he could understand somebody failing to recognise it.

Counsel for the prosecution suggested [13] that the evidence disclosed an illegal operation, and when it went wrong Dr. Newton did everything he possibly could to avoid discovery. In doing that he disregarded the skill he should have displayed in exercising his professional services.

Summing up, Mr. Justice Ashworth called this an unusual and important case. It was important from the Crown's viewpoint because if the jury took the view that this was a case of criminal abortion they might well agree that criminal abortion was more sinister and more difficult to detect when it took place in the high places of Harley Street than in the drab surroundings usually associated with the crime. The emphasis was on the word "unlawful": the use of an instrument was unlawful unless it was used in good faith to preserve the life or health of the woman; and the Crown had to establish that it was not used in good faith.

Passing sentence, the Judge referred to the fact that Dr. Newton's name was removed from the Medical Register from 1942 to 1947, after he had appeared before the General Medical Council for offences relating to false certification.

Obituary

CHARLES SYDNEY ATKIN

B.A., M.B. Cantab.

Dr. Atkin, who died at his home on May 9, came of a long line of Sheffield doctors. His father, the late Dr. Charles Atkin, F.R.C.S., his grandfather, and his great-grandfather all practised in Sheffield.

Born in 1889, he was educated at Marlborough, Caius College, Cambridge, and St. Bartholomew's Hospital, qualifying in 1913. After settling in Sheffield he was for some years a consulting physician at the Children's Hospital there, and during the war of 1914–18 served as captain in the R.A.M.C. with the British Expeditionary Force.

He was a fine athlete, a member of the Cambridge University hockey team, 1909–10. He played hockey for England against Wales, Scotland, and France in 1913, took part in the Olympic Games in 1920, and played against Ireland in 1921. He was also a good tennis player, representing the Hallamshire Tennis Club for several years. Later he became a keen shot and fisherman.

W. R. S. and E. G. M. write:

Dr. Atkin's professional outlook reflected his family tradition of unstinted service, his university and hospital background, his knowledge of men in sport and war, and a long sympathetic experience in practice.

He gave his patients, with all his medical skill, the kindliest understanding and his untiring devotion. No patient ever found him unresponsive to a call for medical help or for moral support and encouragement—but his sympathies not seldom cost him more than the recipients knew.

On medical boards—as member and later as chairman—his experience and insight, with his charitable tolerance, were a support to his contemporaries and an education to his juniors.

Dr. Atkin is survived by his widow, a daughter, and two sons, one of whom is a doctor, now the fifth generation of the family to practise in Sheffield.

14. *ibid.* May 15.
15. *ibid.* May 17.

Public Health

Smallpox

A MAN and his wife have been admitted to New Ferry Smallpox Hospital in Cheshire. There is known to have been contact between these patients and the original cases of smallpox in the district last month.[1] The man is reported [2] to be seriously ill, but the wife's illness is described as mild. The man was admitted for a few hours to the isolation block of Clatterbridge Hospital before being transferred to New Ferry Hospital after the diagnosis had been confirmed. Contacts are being interviewed and offered vaccination.

Eire in 1957

IN Eire last year [3] the birth-rate was 21·2 per 1000 population, which was 0·2 above the rate for 1956. The death-rate—11·9 per 1000 population—was also 0·2 above the rate in the preceding year. The maternal-mortality rate was 1·31 per 1000 births registered, compared with 0·82 in 1956. The infant-mortality rate was 33 per 1000 births registered, and the neonatal mortality rate 22—compared with 36 and 23 respectively in 1956. The death-rate from tuberculosis (all forms) was 24 per 100,000.

Parliament

QUESTION TIME

Temporary Posts Overseas

Mr. JOHN TILNEY asked the Minister whether, in order to help ease the medical requirements of Commonwealth Territories and to expand the knowledge of tropical medicine and problems among members of the National Health Service, he would recommend the proleptic appointments of consultants so that they can do a tour of duty overseas before taking up such appointments.—Mr. WALKER-SMITH replied: I am advised that the National Health Service Acts do not permit me to do so and I am not convinced that what is proposed would achieve the object in mind. I am, however, considering various representations which have been made to me on the subject.

Artificial Limbs and Appliances

Mr. C. SIMMONS asked the Minister whether he would indicate the steps now being taken to develop the work of the department of research and experiment to secure improvements in the design, performance and fitting of artificial limbs; and the extent of any cooperation which existed to secure precise information about new artificial limbs and appliances available in other countries.—Mr. RICHARD THOMPSON, parliamentary secretary to the Ministry, replied: Since last year, the work of the research department at Roehampton has been under the regular supervision of a small executive committee of the Standing Advisory Committee on Artificial Limbs. On the recommendation of these committees, a special plastics laboratory is about to be established. The research staff keep in close touch with colleagues in other countries by correspondence, exchange of literature and samples, and by visits. Two members of the staff are at present visiting research establishments in the United States.

Poliomyelitis in the Vaccinated

Poliomyelitis developed in 1957 in 8 (5 paralytic), 5 (2 paralytic), and 6 (3 paralytic) children in the first, second, and third months respectively after two injections of poliomyelitis vaccine. In one case, which occurred in the first month, the child had paralysis affecting the inoculated limb.

Protective Helmets for Motor Cyclists

According to estimates made by the Road Research Laboratory, over 500,000 motor-cyclists (47%) now use protective helmets.

1. See *Lancet*, April 26, 1958, p. 906; *ibid.* May 3, 1958, p. 959.
2. *Liverpool Daily Post*, May 19.
3. Quarterly report on births, deaths, and marriages, December quarter, 1957, and yearly summary, 1957. Obtainable from Government Publications Sale Office, G.P.O. Arcade, Dublin. Pp. 78. 6*d*.

Notes and News

THE ROYAL SOCIETY

FOR almost a century, its conversaziones have been a notable feature of the annual programme of the Royal Society. But it seems unlikely that, in all this time, the exhibits have ever presented a more striking series of contrasts than they did this year. Among the demonstrations to be seen at Burlington House on May 15, one related to the tracking of satellites (including some recordings made that day of the newly launched Russian giant), and another to the study of dinosaurs' brains. The results of natural selection on certain species of snails could be contemplated during a programme that also included a film on the problems of transonic flight. And, though perhaps the most beautiful of all the exhibits was that showing the mode of formation of ice crystals at sub-zero temperatures, certainly the largest was a working model of Sceptre, the reactor in which temperatures of some four million degrees have been generated.

The equipment for polar research, developed by workers of the National Institute for Medical Research, struck a topical note. It included an improved type of sledging ration, a method of carrying liquid propane in lightweight containers for use as a fuel, and a fabric knitted out of very flexible insulated wire. Underclothes made of this wire will, appropriately connected, function as resistance thermometers, and can then be used to measure skin-temperature. But it is likely that the fabric will find its most important application in the construction of electrically heated clothing, for it can be worn next to the skin and will there produce a maximum heating effect for a minimum energy input.

There were two other items of great medical interest. Sir George Pickering and his colleagues at Oxford showed how they had been investigating the distribution of the pressor substance, renin, in the kidney. The problem of separating the nephron into its glomerular and tubular elements had been overcome by invoking magnetic forces in an ingenious way. The intact kidney was perfused with a suspension of magnetic iron oxide, the particles of which are filtered off by the glomeruli. The kidney was then ground up in Locke's solution, and this suspension was passed in a tube through the field of a powerful electro-magnet. The glomeruli were arrested by virtue of the oxide particles they contained, while the remainder of the mixture, containing the tubular fragments, flowed on. The two fractions could then be assayed separately for their renin content. So far the highest concentrations had been found in suspension of large glomerular fragments, with a segment of the renal tubule attached to them.

New prospects in virology have been disclosed by the discovery of interferon, a compound developed in certain virus cultures which can inhibit the growth of other viruses treated with it. Dr. D. C. Burke and Dr. Alick Isaacs demonstrated the formation of interferon in chick-membrane media inoculated with irradiated influenza virus, and its subsequent concentration and assay. Though its mode of action is still in doubt (it may be an analogue of a protein substance, for which it substitutes in an essential metabolic cycle), it has already been shown capable of arresting the multiplication of several viruses in both in-vitro and in-vivo experiments.

RESEARCH IN EAST AFRICA

WORKING in any country other than his own, the investigator may find himself in difficulty because of variations in local custom and methods. An example mentioned in the report [1] of the East African Council for Medical Research concerns the water content of cereal foods: if these are prepared by certain methods in vogue among African housewives, they may contain so much water as to make ordinary calculation of nutrient values invalid. In other work done at the East African Medical Survey and Research Institute it has been shown that mild hookworm infestations do not affect absorption of food; but the effect of heavy infestations has yet to be investigated. Surveys in certain districts showed that about 70% of school-children were infected by hookworm, and about 90% by schistosomiasis.

The Virus Research Institute has been working mainly on "arbor" (arthropod-borne) infections, and the Leprosy Research Centre (a third of whose cost is borne by the British Empire Leprosy Relief Association) has been conducting a therapeutic trial with diphenylthiourea. The absorption of this drug is poorer than that of dapsone, but indications are that it is equally effective, and it has proved "remarkably free from toxic effects"; in the 56 patients treated there have been no signs of upset of the liver or hæmopoietic system, and no mental disorder. The trial is being extended from the Kenya Medical Department Leprosarium to other centres.

The Trypanosomiasis Research Organisation reports the development of methods for keeping the parasites deep-frozen by means of solid carbon dioxide. By this means trypanosomes of three species have been maintained in an infective state for seven months, and such properties as drug sensitivity have remained stable. Using artificial media, trypanosomes have been cultured from blood in which they were scanty (though the method was not much more sensitive than microscopic examination), but not from cerebrospinal fluid. Strains of the parasite have been found to vary much in oxygen uptake. There is so far no evidence of a special stage of development of the parasite in the mammal, such as takes place with the malaria parasite; the changes in form in the host's blood are attributed to the action of the host's defence mechanisms. Infection does not reduce the length of life of the tsetse fly.

1. The East African Council for Medical Research: Annual Report, 1956–57. Nairobi. 1958. Pp. 20. 4s.

A GREAT AND INVENTIVE SURGEON

A selection [1] of 78 papers by Walter E. Dandy has been published as a tribute to one of the greatest surgeons of all time. The choice has been made in chronological order, beginning with accounts of Dandy's work on the blood- and nerve-supply of the pituitary body. This work was carried out at the suggestion of Harvey Cushing, who was working in the "Dog House" (laboratory) at the same time as Dandy. Dandy's work on infantile hydrocephalus and the circulation of the cerebrospinal fluid is included; it was his first great contribution to surgery and gave him international recognition. Halsted, Dandy's chief, said of this feat, "Dandy will never do anything equal to this again. Few men make more than one great contribution to medicine." According to Dandy himself it was something to do with publication of this work that led to a violent quarrel with Harvey Cushing. The book is specially valuable for its reprint of the epoch-making article on ventriculography, published in July, 1918, while Dandy was still a resident (surgical registrar). The following year his work on air encephalography appeared.

There has never been a more inventive surgeon than Dandy, and anyone on the point of claiming to have found something new should first inquire whether Dandy has written something on the subject. Indeed, this book may serve to stay the hand of some enthusiastic writers. It was Dandy who showed that total removal of acoustic tumours, provided the interior is first removed, gives better results than the intracapsular method of Cushing; and five years before the famous paper by Mixler and Barr, he described protruded lumbar disc as a cause of acute pressure on the cauda equina. ("This lesion offers a pathological basis for cases of so-called sciatica, especially bilateral sciatica. The lesion is cured by operative removal of the cartilage."). Dandy was also the originator of sensory-root section of the trigeminal nerve through the posterior fossa, although his observations about the arrangement of the pain fibres are probably invalid. He clearly defined glosso-pharyngeal neuralgia and cured the condition by intracranial division of the glossopharyngeal nerve. But perhaps one of his most remarkable accomplishments was his successful clipping of the neck of an aneurysm of the internal carotid artery, sans angiography, sans electro-cautery, sans blood-bank, sans hypothermia, and *sans peur*.

1. Selected Writings of Walter E. Dandy. Editors: Charles E. Troland, M.D., and Frank J. Otenasek, M.D., Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957. Pp. 789. 112s. 6d.

His article on spasmodic torticollis has not stood the test of time and should not have been included. Dandy advocated intradural section of the sensory and motor roots of the first three cervical nerves bilaterally and section of both spinal accessory nerves in the neck, a procedure now abandoned by most neurosurgeons. It would have been better to have included Dandy's work on tumours and cysts of the third ventricle. Some of the references are not fully quoted according to present-day conventions. For the sake of the younger neurosurgeons and neurologists, a short biography might have been included.

The authors and publishers are to be congratulated on the production of this valuable book.

University of Cambridge

On May 10 the following degrees were conferred :

M.B., B.Chir.—W. B. Peeling, E. A. French.
M.B.—R. A. Aiken (by proxy).

University of Sheffield

The following appointments have been made:

Dr. P. F. Harris and Dr. Miles Taylor, lecturers in anatomy; Miss E. L. Jervis, lecturer in physiology; Dr. J. A. Beardmore, assistant lecturer in genetics; Dr. Geoffrey Haigh, demonstrator in anatomy; Dr. Margaret Platts, honorary lecturer in medicine; Dr. Derek Hobson, honorary lecturer in bacteriology; Dr. J. P. P. Bradshaw, clinical teacher in neurology; Dr. W. L. Tonge, clinical teacher in psychiatry.

Royal Society

On Thursday, May 29, at 4.30 P.M. at Burlington House, Piccadilly, London, W.1, Group-Captain W. K. Stewart will give a lecture on the Institute of Aviation Medicine.

British Society of Immunology

The next meeting of this society will be held at the National Institute for Medical Research, The Ridgeway, Mill Hill, London, N.W.7, on June 13 and 14. The meeting opens on Friday, the 13th, at 1.45 P.M., with a symposium on gammaglobulin and antibodies, when Sir Charles Harington will be in the chair. Further details may be had from Dr. R. G. White, London Hospital, E.1.

Discussion on Shock

The Faculty of Anæsthetists of the Royal College of Surgeons of England will hold a meeting on Saturday, June 14, at 10 A.M. at the college, Lincoln's Inn Fields, London, W.C.2, on shock and allied phenomena. The speakers will be Sir Henry Dale, Prof. W. D. M. Paton, Dr. J. B. Wyman, Dr. R. I. S. Bayliss, Mr. Ruscoe Clarke, Dr. L. J. Wolfson, and Dr. R. I. Bodman.

Chelsea Clinical Society

In the mountains of Albania Mr. Julian Amery, M.P., was treated by a doctor aged 105, who had ridden for an hour to find him. At the annual dinner of the Chelsea Clinical Society on May 13, he spoke of his medical attendant's belief that we are moving into an era when everyone will live longer—about 200 years, the doctor thought. Mr. Amery was hopefully interested in the reactions of Cabinet Ministers who found themselves in power for terms of 20 years rather than 5.

Sir Walter Fergusson Hannay, the president, described the society as flourishing: it has 283 members and has set its limit at 300. In the past year members had paid a visit to the crypt of St. Bride's in Fleet Street, had heard talks on getting pleasure from painting, on nuclear warfare, and on the future of the independent school, and had held a clinicopathological conference. Dr. H. S. Pasmore, proposing The Guests, quoted Mr. Aneurin Bevan on the folly of trying to make a good speech: people expected a better one next time, and one's reputation was ruined. The Earl of Halsbury replied to the toast.

Inaugurating the new president, his predecessor said that, as secretary for 18 years, Dr. Harry Coke was more than anyone responsible for the society's resuscitation after the war. Dr. Coke said that, on the contrary, the real resuscitator was Dr. Desmond Macmanus, who had been president longer than anyone else. He divulged that the salmon which had lately fed the entire company was caught by Sir Walter himself, in the Spey.

Commonwealth Trans-antarctic Expedition

The Queen has approved the awards of the Polar Medal to the following doctors for good services as members of the expedition :

Clasp to the Polar Medal.—G. W. Marsh.
Polar Medal.—Rainer Goldsmith, A. F. Rogers.

Women Candidates Only

Dr. Marjory Keith, senior registrar at the Bruntsfield Hospital, Edinburgh, has been appointed to the post of consultant physician to the Bruntsfield and Elsie Inglis Hospitals which has been vacant since Dr. Margaret Martin's retirement at the beginning of 1957. The South-Eastern Regional Hospital Board's proposal to join Dr. Martin's post to vacancies at the Deaconess and Longmore Hospitals and advertise the combined post as open to a man or woman aroused controversy in Edinburgh which ended in ten women bringing a case before the Court of Sessions to restrain the board from appointing a man (see *Lancet*, 1957, ii, 1072). Lord Walker granted an order that no man should be appointed until the post had been advertised for women applicants only.

Dr. Keith's appointment, like Dr. Martins, is at the Bruntsfield and Elsie Inglis Hospitals. The vacancy at the Deaconess and Longmore Hospitals has been filled by the appointment as consultant physician of Dr. R. F. Robertson, senior registrar at the Edinburgh Royal Infirmary.

New Atomic Safety Committee

Sir Douglas Veale, late registrar of the University of Oxford, is to preside over a committee set up by the United Kingdom Atomic Energy Authority to advise on training in radiological protection. This committee, whose members include Sir Ernest Rock Carling, Prof. W. V. Mayneord, and Prof. B. W. Windeyer, will advise the Authority on the training and provision of specialist health and safety staff, not only for the Authority's own purposes but also to meet the needs of the nation as a whole. Sir Alexander Fleck's Health and Safety Committee, whose report was published last December, thought that the Authority should assume responsibility for building up the supply of the specialist health and safety staff required as the uses of atomic energy become more widespread. Steps have been taken to build up the staff and recruitment is in progress.

Hospital Progress

When he opened a new outpatient department at Nottingham City Hospital on May 16, Mr. Derek Walker-Smith, the Minister of Health, said that as part of the Government programme of large centrally financed schemes, some 80 hospital buildings were in progress or had been selected for planning. Among these, 6 new hospitals had been begun, and 10 were at various stages of planning. By the end of 1958–59 schemes which would cost about £30 million would be in progress. Hospital boards also had schemes of their own choosing, from the money allocated to them, and there were some 45 further schemes of this sort in progress or proposed, costing more than £100,000 each, as well as many more smaller schemes. But one of our chief aims, the Minister said, was to keep the patient, if possible, out of a hospital bed altogether; or, if he had to have a spell in one, to get him out of it as soon as this could safely be managed. Mr. Walker-Smith was glad that Nottingham, and soon Sheffield, were to have new outpatient clinics for these were important means of achieving his aim. Outpatient clinics helped in both, by undertaking diagnosis and treatment that would formerly have needed admission as an inpatient, and by providing follow-up care and supervision, which allowed a patient to go home after a short stay in hospital. This shift of emphasis from inpatient to outpatient treatment not only led to a fuller and more economical use of expensive hospital service. It was also of social benefit because, as Mr. Walker-Smith pointed out, " people do not normally like to have to stay—especially for a long time—even in the best and most comfortable of hospitals: and therefore the substitution of outpatient for inpatient treatment, and shorter stays in hospital, are likely to be of great social benefit both to the patient and his family ".

Royal Air Force Appointments

Prof. J. B. Kinmonth has been appointed honorary civil consultant in peripheral vascular surgery to the Royal Air Force. Wing-Commander R. S. Peill has been appointed senior medical officer at the Royal Air Force College, Cranwell.

Society for Relief of Widows and Orphans of Medical Men

The report of this society for 1957 shows that the membership now stands at 147 and that 25 widows and 2 orphans received grants. During the year the society distributed £4000, including £2500 from the Brickwell fund. At the end of the year the market value of the society's investments was £107,000 and during the year £2650 savings bonds 3% 1960/70 were bought. The president is Sir Robert Young and the address is 11, Chandos Street, London, W.1.

Social Security Agreement with Belgium

The convention on social security between the United Kingdom and Belgium, which was signed in May, 1957, has now been ratified and will come into force on June 1. It covers cash benefits for unemployment, sickness, maternity, old age, widowhood, orphanhood, industrial accidents and diseases, death, and family allowances. Medical benefits under the Belgium health insurance scheme will be available to citizens of the United Kingdom who are employed in Belgium and to certain other people who are normally resident there.

Gairdner Charitable Foundation

This Foundation, which was incorporated last year in Ontario, derives its funds from the gifts of Mr. J. A. Gairdner, a Canadian industrialist and financier, and members of his family. It has established the following international awards:

Gairdner Foundation award of merit.—A prize of $25,000 to be awarded not more than once in every four years to the individual or group of individuals who has made the most outstanding discovery or contribution in the fields of the arthritic, rheumatic, and cardiovascular diseases.

Gairdner Foundation annual awards.—A series of prizes of $5000 each to be awarded in any one year to not more than five individuals who have made outstanding discoveries or contributions in the same field.

The first awards will be made during 1958, and further particulars may be had from the Foundation, 320, Bay Street, Toronto, 1, Ontario. The medical advisory committee includes Prof. R. F. Farquharson.

Dr. E. C. Warner has been elected to the senate of the University of London as a representative of the faculty of medicine.

Miss K. A. Raven has been appointed chief nursing officer at the Ministry of Health in succession to Dame Elizabeth Cockayne.

Prof. A. D. Macdonald, who is chairman of the Franco-British Pharmaceutical Commission, is leaving for France on May 22 to lecture at the Faculty of Pharmacy at Strasbourg and the Faculty of Science at Besançon.

The Biochemical Society will hold a meeting in the Department of Biochemistry, Tennis Court Road, Cambridge, on Tuesday and Wednesday, June 24 and 25.

Letters to the advice department of the Family Planning Association should once more be addressed to 64, Sloane Street, London, S.W.1. The advice fee has been increased to 2*s.* 6*d.*

A working group in industrial health will form part of the 1958 summer school organised by the Central Council for Health Education at Bishop Otter College, Chichester, from Aug. 19 to 29. Dr. S. F. M. Cressall will be tutor to this group.

A travelling seminar, which has been arranged by the World Health Organisation, will visit France and England from May 19 to June 7 to study industrial medical services. It will be led by Dr. J. J. Gillon, senior medical inspector of factories of the Ministry of Labour in France, and Dr. K. Biden-Steele, deputy senior medical inspector of factories of the Ministry of Labour in England.

The National Society of Non-Smokers held its first London clinic for the cure of tobacco-smoking on May 14, at Caxton Hall, Westminster, at 7.30 P.M. Dr. Lennox Johnston, Dr. Norman Macdonald, and Dr. Wilfred Lester addressed the 60 smokers who attended. The smokers were then split into groups for group psychotherapy. Further clinics will be held on June 25 and July 9 at the same place and time.

Diary of the Week

MAY 25 TO 31

Tuesday, 27th

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. J. K. Oates: Reiter's Disease.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. G. C. Wells: Use of Steroids in Dermatology.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Hammersmith Hospital, Ducane Road, W.12.) Prof. J. L. Wright (Otago): Anatomy of Prolapse.
INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5 P.M. Dr. G. M. Guest (Cincinnati): Studies of Insensible Weight Loss.

Wednesday, 28th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Endocrinology.* Dr. Oswald Savage, Mr. Geoffrey Slaney, Prof. E. G. L. Bywaters: Complications of Long Term Steroid Therapy.
POSTGRADUATE MEDICAL SCHOOL
2 P.M. Dr. C. H. Andrewes: Influenza—Asian and Otherwise.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. J. R. Bignall: Course of Carcinoma of the Lung.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
9.45 A.M. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Professor Wright: Toxæmia and Eclampsia in New Zealand.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. T. Brain: Electrotherapeutic Techniques.

Thursday, 29th

POSTGRADUATE MEDICAL SCHOOL
4 P.M. Dr. Sheila Sherlock: Hepatic Coma.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Arthur Tickner: Epidermal Proteins.
HONYMAN GILLESPIE LECTURE
5 P.M. (Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh.) Prof. Ian Aird: Clinical and Operative Surgery of Parathyroid Tumours.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Small's Wynd, Dundee.) Prof. Sir Stanley Davidson: Megaloblastic Anæmias, with special reference to their Neurological Complications.

Friday, 30th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Queen Anne Street, W.1
5 P.M. Dr. J. S. Scott: Pregnancy Toxæmia Associated with Hydrops Fœtalis, Hydatidiform Mole, and Hydramnios. (William Blair-Bell lecture.)
ROYAL SOCIETY OF MEDICINE
5 P.M. *Pædiatrics.* Dr. A. Doyne Bell: The Force of Habit in Childhood. (Presidential address.)
8.15 P.M. *Obstetrics and Gynæcology.* Dr. G. R. Osborn, Dr. A. E. Claireaux, Dr. Jean Smellie: Neonatal Deaths.
POSTGRADUATE SCHOOL OF MEDICINE
10 A.M. Mr. E. R. Frizelle: Thoughts and Impressions in Gastro-duodenal Surgery.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. C. W. A. Kimbell: Carcinoma Corporis Uteri.
GUY'S HOSPITAL MEDICAL SCHOOL, London Bridge, S.E.1
5 P.M. Dr. H. B. Cott: Protective Coloration in Animals. (Fison lecture.)

Appointments

AUNGLE, P. G., M.B. Edin., M.R.C.P.E., D.P.M.: consultant psychiatrist, Dundee Mental Hospitals.
CUSACK, ANNE L. J., M.B. Dubl., D.P.H.: assistant M.O.H., north-eastern area, Warwickshire.

Birmingham School Health Service:

CARVILL, P. B., L.R.C.P.I.: M.O.
MARSHALL, BARBARA S. M., M.B. Birm.: M.O.
VILLIERS, G. I. L., M.B. Dubl.: M.O.

London County Council:

GRAEME, M. L., M.B. Cantab., D.P.H.: M.O.
MAHON, T. J., M.B. N.U.I., D.C.H., D.P.H.: M.O.
ORTON, W. T., M.B. Belf., D.P.H.: M.O.
WATTON, R. W., M.B. Lond., D.P.H.: M.O.

Colonial Appointments:

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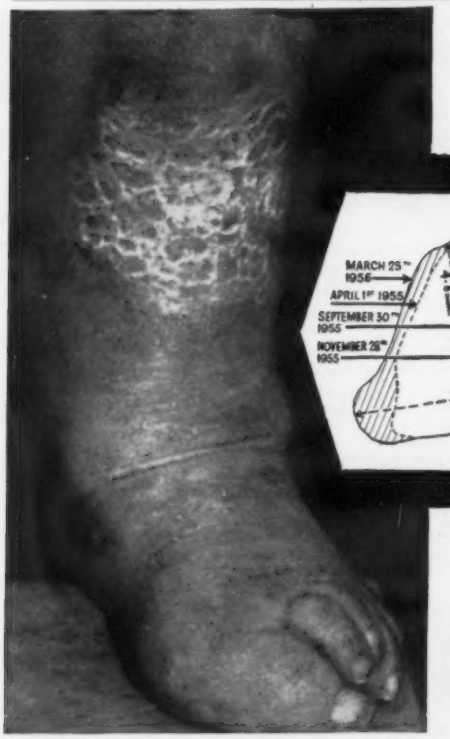

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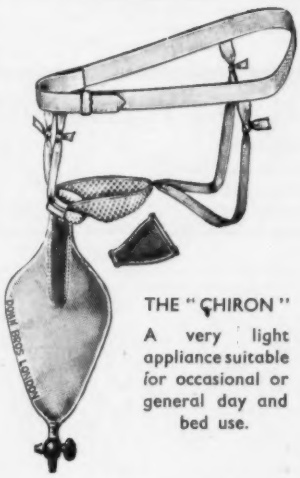

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Academic and Educational

ANÆSTHETICS COURSE

A 2 weeks' COURSE OF LECTURES, DEMONSTRATIONS AND TUTORIALS for postgraduates preparing for higher diplomas in anæsthetics will be held from 16TH to 27TH JUNE, 1958.

Fees: Lectures and Demonstrations £15 15s.

Tutorial Discussion Groups £10 10s.

Further details and application forms may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (Telephone HOLborn 3474, extension 23).

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 14TH JULY, 1958. The following Examination will be held in DECEMBER, 1958.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

UNIVERSITY OF MANCHESTER
FACULTY OF MEDICINE

DIPLOMA IN PSYCHOLOGICAL MEDICINE

A COURSE in preparation for the Diploma in Psychological Medicine will commence in October, 1958, subject to a sufficient number of candidates being available. The instruction is part-time covering 3 half-days per week for 8 terms.

Further particulars as to admission and fees may be obtained from the Dean of Postgraduate Medical Studies, The University, Manchester, 13, to whom applications for entry to the course should be made not later than Monday, 30th June.

THE UNIVERSITY OF LEEDS. Department of Physiology. Applications are invited for appointment as DEMONSTRATOR (Assistant Lecturer) IN PHYSIOLOGY at a salary on the scale £900–£50–£1000 a year if medically qualified or within the range £700–£850 a year if not medically qualified.

Applications (3 copies), stating date of birth, qualifications and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 30th June, 1958.

THE UNIVERSITY OF SHEFFIELD. Applications are invited from graduates in physiology, pharmacology or biochemistry for a post of RESEARCH ASSISTANT in the Department of Pharmacology and Therapeutics to join in the investigation of the effect of ionising radiation on thyroid function. Duties to begin September, 1958. Salary in the range £500–£650.

Further information may be obtained from the Registrar, to whom applications should be sent by 14th June, 1958.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE. Applications are invited from medically qualified candidates for the post of ASSISTANT LECTURER IN ANATOMY. The salary will be in the scale £900–£100–£1250 p.a., the commencing salary being fixed according to qualifications and experience.

Applications (6 copies), containing the names of 3 referees, should reach the Registrar, University College of South Wales and Monmouthshire, Cathays Park, Cardiff (from whom further particulars should be obtained), not later than 14th June, 1958.

OTAGO MEDICAL SCHOOL AND NORTH CANTER-BURY HOSPITAL BOARD, CHRISTCHURCH, NEW ZEALAND. Full-time Teaching and Research Unit, Cashmere Hospital. Applications are invited for the joint position of Full-time SENIOR LECTURER IN MEDICINE AND SENIOR SPECIALIST PHYSICIAN in charge of the full-time teaching and research ward at the new Cashmere Hospital, Christchurch, scheduled to open early in 1959. Salary range £N.Z.2040–£N.Z.2340, or £N.Z.2340–£N.Z.2590 in the case of an appointee of exceptional qualifications and experience.

Conditions of appointment and schedule of duties obtainable from the undersigned or from New Zealand House, Strand, London. Applications should reach the Secretary by 9 A.M. on Monday, 30th June. J. G. LAURENSON, Secretary,
North Canterbury Hospital Board.

Hospital Services: Senior Appointments

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. Applications are invited from registered Women medical practitioners for the appointment of Part-time CONSULTANT SURGEON to the E.N.T. Department at the Elizabeth Garrett Anderson Hospital for 2 sessions per week. Applicants must be Fellows of the Royal College of Surgeons (England). Appointment to commence 1st September. Salary and conditions of service in accordance with those laid down by the Ministry of Health.

Applications, giving details of experience and accompanied by the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 1st July.

NEASDEN HOSPITAL (Infectious Diseases), Brentfield-road, N.W.10. Locum Tenens ASSISTANT PHYSICIAN (whole-time—Senior Hospital Medical Officer grade), 16th June–17th July, 1958, inclusive. Experience in general medicine and infectious diseases. Resident while on duty. The Hospital is a Regional Centre for poliomyelitis.

Applications to the Physician-Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. 2 Part-time CONSULTANT ANÆSTHETISTS to the Leytonstone Group of hospitals for 4 sessions a week each. Duties mainly at Whipps Cross Hospital, E.11. Sessions on fixed days: Monday to Thursday afternoons; Friday morning and 2 afternoon sessions: 1 dental clinic either Tuesday or Friday morning.

Applications (5 copies), stating for which sessions available, with names and addresses of 3 referees, to Secretary, 11A, Portland-place, W.1, by 21st June.

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD.

1. CONSULTANT RADIOLOGIST, 3 half-days a week, West Herts (160 Beds) and St. Paul's (221 Beds) Hospitals, Hemel Hempstead. Attendances required on Mondays, Wednesdays, and Fridays.

Applications before 23rd June, 1958.

2. CONSULTANT OPHTHALMOLOGIST, 1 half-day a week, New End Hospital, Hampstead, N.W.3 (221 Beds).

Applications before 25th June, 1958.

3. ASSISTANT PSYCHIATRIST, 4 half-days a week, Senior Hospital Medical Officer grade, Marlborough Day Hospital, 38, Marlborough-place, N.W.8. Post vacant 1st November, 1958.

Applications before 30th June, 1958.

Hospitals may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

ROYAL FREE HOSPITAL GROUP. Applications are invited from registered dental practitioners for the post of Part-time CONSULTANT DENTAL SURGEON to the Royal Free Hospital Group for 2 sessions per week. Duties to commence 1st October, 1958.

Applications, stating details of qualifications, experience and giving the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 17th June, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST AND MEDICAL SUPERINTENDENT, Rubery Hill Hospital, Birmingham (1021 Beds). D.P.M. and wide experience specialty essential. Resident.

Applications (15 copies), stating name, age, nationality, qualification, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 23rd June, 1958.

CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOSPITAL MEDICAL OFFICER in Chest Disease for duties in hospitals and clinics in the East Kent Area during the absences of Specialists on annual leave commencing 1st July next for a period of 3 months.

Applications to Group Secretary, Central Office, Nunnery Fields Hospital, Canterbury, from whom further information may be obtained.

LINGFIELD HOSPITAL SCHOOL FOR EPILEPTIC CHILDREN. Applications are invited for the post of DEPUTY MEDICAL SUPERINTENDENT to commence duties in the Autumn. Neurological or paediatric experience desirable. Mainly medical but some administrative duties. Salary according to the scale for Senior Hospital Medical Officers. A house is available at a nominal rent for a married man. Superannuable under F.S.S.N.

Applications, stating age, marital status, full particulars of qualifications and experience and names of 2 referees, to be sent to the Medical Superintendent, Lingfield Hospital School, Lingfield, Surrey.

LIVERPOOL REGIONAL HOSPITAL BOARD. Liverpool RADIUM INSTITUTE. Applications are invited for the post of Whole-time ASSISTANT RADIOTHERAPIST (Senior Hospital Medical Officer) with duties at the above Hospital. The successful applicant will work under the guidance of the Director of Radiotherapeutic Services and the post affords special experience in isotope work. Preference will be given to candidates holding a Diploma in Radiology but consideration will be given to candidates holding other higher qualifications.

Forms of application, from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 14th June, 1958.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Maximum Part-time CONSULTANT GERIATRICIAN to the Preston and Chorley Group of hospitals, mainly at Sharoe Green Hospital, Preston, and Eaves Lane Hospital, Chorley. Good experience in general medicine; special interest and experience in the treatment and rehabilitation of the chronic sick, and higher qualifications essential. Appointee required to undertake the domiciliary investigation of patients and establish close liaison with general practitioners and local health authorities and to reside in the area. 16th June, 1958.

(*b*) Whole-time CONSULTANT PATHOLOGIST to the Bury and Rossendale Group of hospitals, mainly at Bury General Hospital. Wide experience in hospital pathology essential, and higher qualifications desirable. Appointee to live in or near to Bury. 19th June, 1958.

(*c*) Part-time (8 half-days weekly) CONSULTANT OPHTHALMOLOGIST to the Wigan and Leigh Group of hospitals (Royal Albert Edward Infirmary, Wigan, and Leigh Infirmary). Wide experience, higher qualifications essential; appointee to live in area. 10th June, 1958.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by the dates stated.

NEWCASTLE REGIONAL HOSPITAL BOARD. Con-SULTANT ANÆSTHETIST, whole-time or maximum part-time, for Newcastle upon Tyne Group of hospitals (total bed complement 1700 Beds)—main hospital, Newcastle General (835 Beds).

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Con-SULTANT GENERAL SURGEON, whole-time, or part-time for 9 sessions per week, for North West Durham Group of hospitals —main hospital, Shotley Bridge General (533 Beds). To reside in this area.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, whole-time or maximum part-time, for South East Northumberland and Newcastle Groups of hospitals, &c. Main hospitals—Preston, North Shields (50 obstetric and 38 gynæcology beds); Sir G. B. Hunt Memorial, Wallsend (about 10 consultant and some general practitioner obstetric beds). Appointee will also have 2 out-patient clinics per week at Newcastle General Hospital (835 Beds) and will visit Berwick Infirmary (36 Beds). To live in or near Wallsend area.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEW ZEALAND. HAWKE'S BAY HOSPITAL BOARD, NAPIER, NEW ZEALAND. Applications, closing on Thursday, 31st July, 1958, are invited from duly qualified medical practitioners, for the position of PATHOLOGIST to the Hawke's Bay Hospital Board. Salary in accordance with experience and qualifications:—

Junior Specialist: £1640–£1940 p.a.
Senior Specialist:
(*a*) £2590–£2890 p.a.
(*b*) £2340–£2590 p.a.
(*c*) £2040–£2340 p.a.

(Commencing salary within these scales will be determined by the Salaries Grading Committee of the Department of Health.)

Conditions of appointment, and schedule of duties, may be obtained on application to the High Commissioner for New Zealand, London. R. P. NORTHE, Managing Secretary.
Hawke's Bay Hospital Board, Napier, New Zealand.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. MEDICAL UNIT, DUNEDIN HOSPITAL, UNIVERSITY OF OTAGO. SENIOR ASSISTANT on the Clinical and Teaching Staff and LECTURER IN MEDICINE. Applications are invited for the position of Senior Assistant on the Medical Unit, Dunedin Hospital and University of Otago, from persons holding a degree in medicine of an approved university and who either:—

(*a*) Hold a higher qualification and have had 2 or more years' practical experience in medicine.
(*b*) Have been qualified for 6 years or more and have had 3 years' or more practical experience in medicine.

The Senior Assistant ranks as Lecturer or Senior Lecturer in Medicine and as a Junior Specialist and the salary payable is that under the Hospital Employment (Medical Officers') Regulations, viz £1640–£1940. The commencing rate of salary within the scale will be that determined by the Medical Officers' Salaries Grading Committee in accordance with the qualifications and experience of the appointee.

Applicants should have a good background in medicine. The position is non-resident, is full-time, and private practice is not permitted.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, The Strand, London, or from the undersigned. Travelling expenses will be paid in accordance with the table set out in the conditions of appointment.

Applications, stating age, qualifications and experience, together with health and radiological certificates and testimonials, will be received by the undersigned up to 10 o'clock A.M. on Monday, 28th July, 1958. W. A. WILLIAMSON, Secretary.
Otago Hospital Board,
P.O. Box 946, Dunedin, New Zealand.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. UNIVERSITY OF OTAGO, DUNEDIN. Department of Obstetrics and Gynæcology. Applications are invited for the position of Full-time ASSISTANT AND LECTURER (Junior Specialist grade) from those who hold a degree in medicine of an approved university and who hold, in addition, the M.R.C.O.G.

The position is designated as that of a Junior Specialist under the Hospital Employment (Medical Officers) Regulations 1952, Amendment No. 1. Salary scale £1640–£1940 by annual increments of £100. Commencing rate of salary, according to qualifications and experience, will be determined by Medical Officers Salaries Grading Committee of the Department of Health.

Duties will include teaching of obstetrics and gynæcology to medical undergraduates, research and clinical work in the Dunedin Hospital. The position is a non-resident one.

Forms of application and conditions of appointment may be obtained from the Office of the High Commissioner for New Zealand, 415, The Strand, London.

Applications, stating age, qualifications and experience, together with testimonials, health and radiological certificates, will be received by the undersigned until 10 o'clock A.M. on Monday, 28th July, 1958.

W. A. WILLIAMSON, Secretary, Otago Hospital Board.
P.O. Box 946, Dunedin, New Zealand.

UGANDA. MULAGO HOSPITAL, Kampala, Uganda. MEDICAL RESEARCH COUNCIL require a MEDICAL OFFICER with an interest in research, preferably with pædiatric experience in Africa, for work at their Infantile Malnutrition Research Unit at above Hospital. The person appointed will be required to identify himself with the research programme of the Unit, which aims at a comprehensive study of the effects of malnutrition on the growth and development of the African child. Sick children are treated in research wards, and the progress of healthy children is followed at a welfare clinic and at schools. Salary, according to age and experience, on scale equivalent to Senior Registrar or higher, supplemented to appropriate overseas level. Child allowances of £50 p.a. per child payable in addition. Appointment for initial tour of 18 months, plus 90 days' home leave (including Sundays and travelling time) with a possibility of further tour(s) leading to permanent employment with the Council. Superannuation provision will be made under the Federated Superannuation System for Universities or it may be contained under the National Health Service scheme.

Write (full personal particulars and experience, plus a list of references to published work, and the names of 2 professional referees) to Personnel Officer, Medical Research Council, 38, Old Queen-street, Westminster, S.W.1.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of GROUP ADMINISTRATIVE MEDICAL SUPERINTENDENT to the Glasgow Victoria Hospitals. Salary on the scale £1916 5s.–£78 15s.–£1995–£105 (2)–£2205.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST required, to be designated Medical Superintendent of Balderton Hospital, near Newark, a new hospital (with 252 Beds at present) for all grades of mental defectives.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 15th June, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT CHEST PHYSICIAN (Senior House Medical Officer grade) for Croydon Chest Clinic area. Duties mainly at the Central Chest Clinic (33, Mayday-road, Thornton Heath, Surrey) and with associated beds. The appointment is a joint one with the County Borough of Croydon and will also involve duties (25% approximately) under the schools' B.C.G. programme, under arrangements with the County Borough Council. Candidate appointed will work under the direction of the Consultant Chest Physician. Wide experience in tuberculosis and diseases of the chest is desirable and higher medical qualifications an advantage.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.11, by 21st June, 1958. Applicants may visit Clinic by arrangement with the Consultant Chest Physician.

Hospital Services: Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON. Post recognised for the D.Obst.R.C.O.G. Appointment is for a period of 6 months, vacant 16th June, 1958.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, to the Secretary, not later than 31st May, 1958.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. HOUSE SURGEON, pre-registration post. Immediate vacancy.

Applications, stating experience, and copies of 2 testimonials, to Hospital Secretary.

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts:—

NON-RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience) for 6 months from 1st August, 1958, with eligibility for reappointment. Candidates must have held a resident hospital appointment.

RESIDENT HOUSE PHYSICIAN (3 vacancies). 2 vacancies for 6 months from 1st August, 1958. Duties include work in Outpatient Department and wards. 1 vacancy for 9 months from 1st August, 1958. The first 3 months at Brompton Hospital Sanatorium, Frimley, and the following 6 months at the Hospital in London covering work in Outpatient Department and wards. Salary at the rate of £577 10s. p.a.

RESIDENT HOUSE PHYSICIAN to the Cardiac Department for 6 months from 1st August, 1958. Duties include work in Outpatient Department and wards. Salary at the rate of £577 10s. p.a.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 7th June, 1958, to KENNETH A. F. MILES, House Governor.

CHARING CROSS HOSPITAL. Wembley Hospital. (135 Beds.) SURGICAL REGISTRAR (resident) required as soon as possible. Fellowship desirable, F.R.C.S. recognised.

Apply immediately to the undersigned.
FRANK HART, Secretary to the Board.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE SURGEON required for 6 months. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Vacant 11th June, 1958. Salary £819 10s. p.a. less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

FOUNTAIN GROUP HOSPITAL MANAGEMENT COMMITTEE. Immediate applications are invited from registered medical practitioners (Male or Female, resident or non-resident) for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. National Health Services salary scale. The Fountain Group caters for 660 mentally defective children, 80 adult female defectives and 50 blind children, and provides wide experience in neurology, pædiatrics and child psychology, as well as in mental deficiency. There are Clinical, Neuropathological and Biochemical Research Units and clinical conferences are held weekly. Numerous lectures are given to students and graduates.

Applications, giving full particulars and names of 3 referees, to Secretary, Fountain Hospital, Tooting-grove, London, S.W.17.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR in the Children's Department with duties at the Evelina Hospital for Sick Children. Appointment as soon as possible until 30th September, 1959, in the first instance.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, S.E.1, not later than 2nd June, 1958.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of REGISTRAR in the Department of Diagnostic Radiology at Guy's Hospital, with appointment as soon as possible until 30th September, 1959, in the first instance. It is desirable but not essential that applicants should hold the D.M.R.D.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 4th June, 1958.

HACKNEY HOSPITAL, London, E.9. (General—853 Beds.) Applications for the 6 months' resident appointment, vacant 18th June, of pre-registration HOUSE PHYSICIAN should reach the Secretary, above address, by 2nd June, quoting HH/PHP.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Joint appointment with the North West Metropolitan Regional Hospital Board. Whole-time REGISTRAR (orthopædics) required for 2 years from 1st August, 1958. Appointment tenable for first year at Hammersmith Hospital and Postgraduate Medical School (non-resident) studying orthopædic and traumatic surgery, transferring to Heatherwood Hospital, Ascot (resident), for second year studying long-term orthopædic surgery.

Detailed applications, names 2 referees, to Secretary, The Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, W.12, by 9th June.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (radiotherapy) required. Post vacant 1st July.

Detailed applications, names 2 referees, to Secretary, Board of Governors, The Hammersmith, West London, and St. Mark's Hospitals, Ducane-road, London, W.12, by 9th June.

HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medicel practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £819 10s. p.a. Vacant 1st July, 1958, tenable for a period of 6 months at the Main Outpatient Department, Bayham-street, N.W.1.

Application forms may be obtained from the Administrative Assistant, to whom they should be returned, together with copies of 3 recent testimonials, by 30th May, 1958.

HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the pre-registration post of NON-RESIDENT CASUALTY OFFICER (medical or surgical) vacant 1st July, 1958, tenable for a period of 6 months.

Application forms may be obtained from the Administrative Assistant, to whom they should be returned, together with copies of 3 recent testimonials, by 30th May, 1958.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE PHYSICIAN, to become vacant on Monday, 30th June, 1958. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Monday, 2nd June, together with copies of 3 recent testimonials.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registered and registered medical practitioners for the appointment of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON. Appointment for 6 months from 1st July, 1958. It would be convenient if successful candidate could carry out fortnight's locum duty commencing 17th June, 1958. Hospital recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Application forms from the Secretary. Self-addressed envelope should be enclosed.

LAMBETH HOSPITAL, Kennington, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE SURGEON vacant 5th June, 1958. Hospital recognised for F.R.C.S.

Application forms from the Hospital Secretary.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Anæsthetics becoming vacant on 1st August, 1958.

Applications (6 copies), together with 6 copies of 3 recent testimonials, should be received by the undersigned by 4th June, 1958. H. BRIERLEY, House Governor.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE PHYSICIANS (pre- or post-registration). Posts vacant on 3rd and 9th July, 1958. 6-month appointments.

Applications, stating age, experience, &c., and copies of not more than 3 testimonials, to be sent to the Hospital Secretary.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (anæsthetist). The post is recognised for the F.F.A. R.C.S.

Apply, stating age, nationality, qualifications and experience, together with 2 testimonials, to the Hospital Secretary.

MILE END HOSPITAL, Bancroft-road, London, E.1. (479 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant immediately.

Application forms, obtainable from Physician-Superintendent, to be returned by 30th May, 1958, with copies of not more than 3 testimonials.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON at The National Hospital, Queen-square, London, W.C.1, to commence 1st July, 1958. This post carries the grade of Registrar. The appointment will be for 6 months in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 30th May, 1958.

H. EWART MITCHELL,
Secretary to the Board of Governors.
The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. HOUSE OFFICER (resident—medical or surgical) to the Neuro-surgical Department at the Maida Vale Hospital for Nervous Diseases, London, W.9. Appointment in the first instance for 6 months. Grading as Senior House Officer or Registrar according to experience.

Applications, giving the names of 3 referees, to be sent to the Secretary at the Maida Vale Hospital, W.9, not later than 2nd June, 1958.

NEASDEN HOSPITAL (Infectious Diseases), Brentfield-road, N.W.10. Whole-time Locum Tenens REGISTRAR, from 18th to 25th July, 1958, inclusive. Resident; or resident on duty—approximately alternate nights. Experience in all types acute infectious diseases, including poliomyelitis

Applications to Physician-Superintendent.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident, not pre-registration). Post vacant 17th June. Recognised for F.R.C.S.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, should be sent to the Secretary at above address.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

SENIOR REGISTRAR in Psychiatry required under Joint Training Scheme. Initially in Psychiatric Unit of 24 observation beds and 36 Beds for treatment of neuroses and early psychoses at St. Clement's Hospital, E.3 (resident or non-resident). Unit run in conjunction with The London Hospital, E.1, and Claybury Hospital, where there will be later periods of service.

Appointment subject to annual review.

Runwell Hospital, near Wickford, Essex

PSYCHIATRIC REGISTRAR. Resident or hon-resident. Single accommodation only.

Tottenham Group of hospitals (based on St. Ann's General Hospital, N.15)

REGISTRAR in Pathology (resident or non-resident).

Whipps Cross Hospital, E.11

REGISTRAR in Pathology. Recognised for D.Path. Non-resident.

Bethnal Green Hospital, E.11

SURGICAL REGISTRARS (2 posts). Resident or non-resident. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 7th June.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited for the post of ADMISSIONS OFFICER (Senior House Officer grade). 6 months' appointment, with possibility extension to 1 year. Non-resident. Vacant 1st July. A busy post in a new department. Evenings and weekends (from 1 P.M. Saturday) free.

Applications, with full details and copies of recent testimonials or names of 2 referees, should reach the Secretary of the Hospital not later than 29th May.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited from pre-registration and registered medical practitioners for 4 posts of RESIDENT HOUSE SURGEON. 6 months' appointment. Vacant beginning of July. All posts recognised for F.R.C.S.

Applications, stating age, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital.

NORTH MIDDLESEX HOSPITAL, London, N.18. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN (general medicine). 6 months' appointment, starting 1st July. Approved pre-registration post (first or second).

Applications, stating age, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital.

POPLAR HOSPITAL, East India Dock-road, London, E.14. SENIOR HOUSE OFFICER. Duties are mainly in connection with the Receiving Room and Casualty Department. Post recognised for F.R.C.S. examination.

Applications, giving full details, to Group Secretary, 2A, Bow-road, E.3.

POPLAR HOSPITAL, East India Dock-road, London, E.14. SENIOR HOUSE OFFICER (Physician) required middle of June.

Applications, giving full details, to Group Secretary, 2A, Bow-road, E.3.

PUTNEY HOSPITAL, Lower Common, S.W.15. House PHYSICIAN (resident—Male or Female). Vacant 17th June, 1958. Open to pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 4th June, 1958.

PUTNEY HOSPITAL, Lower Common, S.W.15. House SURGEON (resident). Vacant 16th June, 1958. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 4th June, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (third post) for 6-months commencing 15th June, 1958.

Applications, with the names of 2 referees, to Hospital Secretary by 30th May, 1958.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2, Shadwell, E.1, BANSTEAD, SURREY. 2 HOUSE OFFICER appointments.

(i) For 2 consecutive periods of 6 months, commencing 15th June, 1958, or earlier if possible; first period House Physician, Hackney-road; second period House Surgeon, Hackney-road (2 months), and Casualty Officer, Shadwell (4 months).

(ii) For 6 months, commencing 1st July, 1958, at Hackney-road, 2 months as House Surgeon and 4 months as Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with copies of not more than 3 testimonials, not later than 31st May, 1958.

REGIONAL NEUROSURGICAL CENTRE. (66 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery). Vacant 1st July. Post recognised for F.R.C.S. and D.P.M. and provides excellent opportunity for training in neurology.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON, vacant 17th June, 1958. Post recognised for F.R.C.S. examinations, and is tenable for 6 months. Candidates will be required to attend for interview.

Applications, stating age and full particulars, to Secretary not later than 9th June, 1958.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Second RESIDENT ANÆSTHETIST (Senior House Officer grade) required immediately. Appointment recognised for D.A.

Applications, with copies of recent testimonials, to be sent to the Hospital Secretary.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time REGISTRAR in Orthopædic Surgery to fill a vacancy in the approved trainee establishment at the Greenwich and Deptford Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 7th June, 1958.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for the post of RESIDENT DENTAL HOUSE SURGEON for a period of 6 months from a date to be arranged this summer. The appointment is recognised by the Royal College of Surgeons for the purposes of the Fellowship in Dental Surgery and the holder will gain experience in all branches of dental and oral surgery.

Applications, together with the names of 2 referees, should be submitted to the undersigned as soon as possible.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for the post of Part-time CASUALTY PHYSICIAN, tenable from 1st October, 1958. The appointment, which is of Senior Registrar status, will be for 5 sessions per week.

Applications, together with the names of 2 referees, should be submitted to the undersigned within the next 21 days.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. CLEMENT'S HOSPITAL, Bow-road, London, E.3. Locum Tenens SENIOR HOUSE OFFICER required for the period 1st–24th June, preferably with some mental observation unit experience.

Apply Hospital Secretary (Telephone no.: ADVance 1325).

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of REGISTRAR to the Department of General Surgery, which includes Thoracic Surgery, in the St. George's Hospital Group. The successful candidate would be required to take up duty in mid-July, 1958, and the appointment will be for 1 year in the first instance. Candidates should hold the Diploma of the F.R.C.S. (Eng.).

Applications, stating age, education, qualifications, experience and the names and addresses of 2 referees, should reach the undersigned not later than 7th June, 1958.

P. H. CONSTABLE, House Governor.

ST. GILES HOSPITAL, Camberwell, S.E.5. Applications invited for appointment as SENIOR HOUSE OFFICER (obstetrics and gynæcology). Recognised for M.R.C.O.G. Vacant in June. Resident post.

Apply, giving details of age, qualifications and previous posts with copy testimonials or names of 2 referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 31st May.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. Part-time CLINICAL ASSISTANT (ophthalmology) required for 1 outpatient session per week on Thursday afternoon. Salary £183 15s. p.a.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 4th June.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. House PHYSICIAN required immediately.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 31st May.

ST. MARY'S HOSPITAL, W.2. Outpatient Surgical ASSISTANT (part-time—graded Senior House Officer) for 2 notional half-days per week (Wednesday A.M., Friday P.M.) for a first period of 12 months as from a date to be arranged.

Applications, giving full details and names and addresses of 3 referees, should reach the House Governor not later than 4th June, 1958.

ST. MARY'S HOSPITAL, W.2. Registrar (part-time) to the E.N.T. Department for a first period of 12 months from 9th June, 1958, for 2 notional half-days per week (Monday A.M., Thursday A.M.).

Applications, giving full details and names and addresses of 3 referees, should reach the House Governor not later than 3rd June, 1958.

ST. MARY'S HOSPITAL, W.2. Casualty Surgeon, graded Senior House Officer (non-resident), required for first period of 6 months from 1st July, 1958.

Applications, giving full details with names and addresses of 3 referees, should reach the House Governor not later than 6th June, 1958.

ST. OLAVE'S HOSPITAL, Lower-road, S.E.16. Bermondsey and Southwark Group Hospital Management Committee. 2 vacancies for HOUSE PHYSICIANS (pre-registration posts), will occur—1 on 16th June, and second on 1st July, 1958, at above Hospital. Positions tenable for 6 months.

Applications, with full details and names of 2 referees, to the Secretary at above address, within 1 week of advertisement.

ST. THOMAS'S HOSPITAL and SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Joint appointment. Whole-time SENIOR REGISTRAR in Obstetrics and Gynæcology at Lambeth Hospital and St. Thomas's Hospital. The successful candidate will be required to take part in undergraduate teaching.

Applications (5 copies), including names and addresses of 3 referees, to the Clerk of the Governors, St. Thomas's Hospital, S.E.1, by 31st May, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. 2 Senior RESIDENT ANÆSTHETISTS (Senior House Officer grade), for a period of 6 months, renewable for a second 6 months from 12th August, 1958.

Applications, naming 2 referees, to the Clerk of the Governors by 7th June, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. Applications are invited from fully registered medical practitioners for the following appointments:—

Non-resident:

SENIOR HOUSE OFFICER to the Children's Department for a period of 1 year from 26th August, 1958.

Resident

SENIOR MEDICAL CASUALTY OFFICER AND RESIDENT PATHOLOGIST (Senior House Officer grade).

SENIOR SURGICAL CASUALTY OFFICER (Senior House Officer grade).

SENIOR HOUSE OFFICER or HOUSE OFFICER to the Thoracic Surgical Unit (grade according to qualifications and experience).

HOUSE PHYSICIAN to the Children's Department.

HOUSE PHYSICIAN to the Department of Psychological Medicine.

HOUSE PHYSICIAN to the Departments of Neurology and Thoracic Medicine.

All for a period of 6 months from 12th August, 1958.

Applications, naming 2 referees, to the Clerk of the Governors by 31st May, 1958.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 12th July, 1958, for a RESIDENT ASSISTANT PHYSICIAN (Senior Registrar).

Further particulars and forms of application, which must be returned not later than 16th June, 1958, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of ANÆSTHETIC REGISTRAR for 1 year from 1st July, 1958.

Applications, with names of 2 referees, to Administrator and Secretary by 6th June, 1958.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE OFFICER in the Geriatric Unit at above Hospital. This post, vacant 7th June, 1958, offers excellent scope for persons interested in this specialty as the most modern methods of geriatric treatment are employed.

Application forms obtainable from the Hospital Secretary, to be returned by 27th May, 1958.

WHIPPS CROSS HOSPITAL, Leytonstone, E.11. Leyton-STONE (NO. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) at above Hospital. The post, which is vacant now, is a resident one, and is recognised for the Diploma and Fellowship of Anæsthetists.

Application forms obtainable from the Hospital Secretary, to be returned by 2nd June, 1958.

WHITTINGTON HOSPITAL, London, N.19. Applications are invited for the following appointments:—

* HOUSE PHYSICIAN (general medicine). 4 posts recognised for M.D. (Lond.).

HOUSE PHYSICIAN (post-registration — neurosurgical). Recognised for M.D. (Lond.)

† HOUSE SURGEON (general surgery). 5 posts recognised for F.R.C.S. (Lond.)

HOUSE SURGEON (obstetrics). Post recognised for M.R.C.O.G. in obstetrics.

* HOUSE PHYSICIAN (pædiatrics). Post recognised for M.D. (Lond.) and D.C.H.

SENIOR HOUSE OFFICER (Chest Unit). 2 posts.

All posts vacant 1st July, 1958.

* Pre-registration candidates who have already held a first appointment may apply.

† Pre-registration candidates may apply.

Application forms obtainable from Group Secretary, 46, Cholmeley-park, London, N.6 (ARCHway 3070, extension 527), and returnable to the Medical Superintendent, Whittington Hospital, London, N.19, by 2nd June, 1958.

WHITTINGTON HOSPITAL, London, N.19. Senior HOUSE OFFICER (casualty). Vacant now, non-resident post.

Application forms obtainable from Group Secretary, 46, Cholmeley-park, London, N.6 (ARChway 3070, extension 527), and returnable to the Medical Superintendent, Whittington Hospital, London, N.19, by 3rd June, 1958.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of MEDICAL REGISTRAR for 1 year in first instance from 13th August, 1958.

Applications (5 copies), with names of 2 referees, to House Governor by 7th June.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS. 5 posts vacant 1st July. 3 at Memorial Hospital, Woolwich; 2 at St. Nicholas Hospital, Plumstead. All appointments approved for pre-registration service and recognised for F.R.C.S.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIANS. 6 appointments vacant 1st July. 3 at St. Nicholas Hospital, Plumstead; 3 at Brook General Hospital, Woolwich. Posts approved for pre-registration service.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18, not later than 1st June, 1958.

ABERGAVENNY. PEN-Y-VAL HOSPITAL. Vale of Usk HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Salary according to national scale. Residential accommodation available for single person. Experience in psychiatry not essential.

Applications, stating age, nationality, qualifications and present appointment, together with the names of 2 referees, to be forwarded immediately to the Medical Superintendent, Pen-y-val Hospital, Abergavenny, Mon.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOSPITAL. MID-WALES HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required (resident). Post recognised for F.R.C.S. examination. Vacancy immediate.

Applications, stating age, experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. Applications are invited from registered medical practitioners for the post of Whole-time ORTHOPÆDIC REGISTRAR. Post provides experience in non-pulmonary tuberculosis and general orthopædics, and includes attendances at peripheral clinics. It is recognised for 6 months' training under F.R.C.S. regulations. The post is resident for married or single persons. Canvassing disqualifies, but visit to Hospital welcomed.

Write to the Secretary for application form.

AMERSHAM GENERAL HOSPITAL, Buckinghamshire. (297 Beds.) SENIOR RESIDENT HOUSE OFFICER required immediately for Orthopædic and Casualty Department for period of 1 year. Post recognised for F.R.C.S. The Department forms part of the Regional Accident and Orthopædic Service based on the Nuffield Orthopædic Centre, Oxford.

Applications, with names and addresses of 3 referees, to Hospital Secretary.

AMERSHAM GENERAL HOSPITAL, Buckinghamshire. Locum SENIOR HOUSE OFFICER required for Orthopædic and Casualty Department.

Apply to Hospital Secretary.

AMERSHAM GENERAL HOSPITAL, Buckinghamshire. HOUSE PHYSICIAN, pre-registration post, vacant 17th June, required for busy general hospital of 297 Beds. Post offers wide and varied experience with 1 of 2 medical firms with care of 28 general medical and 6 dermatological beds.

Applications, with full details and names of 3 referees, to Secretary.

AMERSHAM GENERAL HOSPITAL, Buckinghamshire. RESIDENT HOUSE SURGEON required 1st June, 1958. This appointment in a busy general hospital of 297 beds with 5 resident House Officers affords excellent experience. Post recognised for F.R.C.S. examination. Pre-registration applicants considered.

Apply, with names of 2 referees, to Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEONS (2) for Traumatic and Orthopædic Unit. Posts vacant now. 6-month appointments, suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON for general surgical duties. Post vacant 27th May, 1958. 6-month appointment, suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BARRY ACCIDENT AND SURGICAL HOSPITAL. SENIOR HOUSE OFFICER required at above Hospital. House available to rent.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BEBINGTON, WIRRAL, CHESHIRE. CLATTERBRIDGE HOSPITAL. CENTRAL WIRRAL GROUP. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (casualty/orthopædics) (resident or locum). Salary in accordance with current terms and conditions of service, i.e., £852 10s.–£55–£1182 10s. p.a., less £170 p.a. for residential facilities.

Application forms, obtainable from the Secretary, should be returned within 7 days of the appearance of this advertisement.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) SENIOR HOUSE OFFICER required, whose duties will be mainly casualty. The post is tenable for 1 year, and will be vacant in early June. Small furnished flat available.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARNSTAPLE, NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration) required from mid-July.

Applications, naming 2 referees, to Group Secretary, 19, Alexandra-road, Barnstaple, N. Devon.

BEDFORD GENERAL HOSPITAL. (431 Beds.) ResiDENT HOUSE SURGEON (gynæcology and obstetrics). Vacant 30th June. Post recognised for D.Obst.R.C.O.G. The Maternity Unit comprises 75 obstetric and 26 gynæcological beds, and the Hospital has a busy Outpatient Department.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 28th May.

BEDFORD GENERAL HOSPITAL. (431 Beds.) House SURGEON required. Pre- or post-registration ; recognised for F.R.C.S. Vacant early June. Post offers exceptional opportunities for general experience in busy acute surgical units.

Inquiries and applications, with copies of 2 recent testimonials, to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE SURGEON (House Officer or Senior House Officer grade, according to experience). Vacant 1st June, 1958. General surgical duties, some orthopædics. Offers good opportunity for general experience in busy acute general hospital. Recognised for F.R.C.S. Approved pre-registration post but fully registered practitioners may apply.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

BEXHILL HOSPITAL, Bexhill-on-Sea. (62 Beds.) House SURGEON required. Resident—pre-registration post vacant now. National scale of salary.

Apply to Hospital Administrator.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **West Bromwich Group, Edward-street, West Bromwich**

REGISTRAR (general medicine), Hallam Hospital, West Bromwich. (80 acute medical and 53 chronic sick beds). Vacant 1st July. Experience in specialty desirable. Resident. 2 House Physicians.

(2) **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (infectious diseases and general medicine). (60 and 25 Beds.) Including respiratory paralysis unit and emergency duties in skin and chest wards. Whitley Hospital, Coventry (153 Beds). Liaison with Paediatric Department. Flat available.

Application forms from Group Secretaries, to be returned by 2nd June, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Wholetime SENIOR PSYCHIATRIC REGISTRAR. Duties at All Saints' Hospital (1385 Beds) and Uffculme Early Treatment Centre, Birmingham. Required to reside in hospital when on duty. Experience specialty required. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with arrangements for the interchange of Senior Registrars agreed between the 2 Boards.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned by 9th June, 1958.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE SURGEON (pre-registration).

Applications, stating age, qualifications and names of referees, to Medical Superintendent.

BIRMINGHAM. TAYLOR MEMORIAL HOME, Grange-road, ERDINGTON, BIRMINGHAM, 24. CLINICAL ASSISTANT required for 2 sessions per week (General Medical Practitioner), for inpatients (advanced malignant disease). Vacant 1st September, 1958.

Applications to the Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS AND THE BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications are invited for the joint appointment of SENIOR REGISTRAR in Radiotherapy (non-resident) on the basis of 5½ sessions per week in the United Hospitals and 5½ sessions with the Birmingham Regional Hospital Board (duties at Dudley Road Hospital, Birmingham, in first instance). Candidates should possess the D.M.R.T. or a higher qualification in medicine or surgery.

Forms of application from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, to be returned by 7th June, 1958.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Medicine. The appointment is tenable for 1 year. Candidates must be registered medical practitioners and have held a resident appointment.

Forms of application may be obtained from, and should be returned to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, by 31st May, 1958.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. RESIDENT MEDICAL OFFICER in Infectious Diseases, Senior House Officer grade. Hospital serves a wide area and gives opportunities for the study of infectious diseases, and has a poliomyelitis respiratory unit. Part of the Hospital is being developed as general hospital, where further experience can be gained.

Apply Physician-Superintendent with 2 testimonials.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE OFFICER (resident) required. Recognised for D.O. and F.R.C.S. in Ophthalmology. Wide experience available in all branches including surgery.

Detailed applications to the Group Secretary, Dudley Road Hospital, Birmingham, 18.

BISHOP AUCKLAND. GENERAL HOSPITAL. House OFFICER (obstetrics and gynæcology). Applications invited from registered or pre-registration practitioners. Post vacant 1st July, 1958. Recognised for D.Obst.R.C.O.G. Departmental Beds 69.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee, at above address.

BISHOP AUCKLAND, CO. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) HOUSE PHYSICIAN required. Fully registered or provisionally registered practitioner.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, South West Durham Hospital Management Committee, at the above address.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Applications invited for post of HOUSE OFFICER (surgical) (pre-registration). Salary £467 10s.–£522 10s. p.a. less £125 for residential emoluments. Appointment to commence immediately.

Applications, stating age, nationality, qualifications and experience with copies of 2 testimonials or names of referees, to Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. (341 staffed beds.) Applications invited for appointment of SENIOR HOUSE OFFICER (medical) for special departments, giving experience in general and chest medicine, dermatology, pædiatrics, and physical medicine, and involving care of approximately 65 Beds in all. Salary £819 10s. p.a. less £150 p.a. in respect of residential emoluments. Appointment to commence 25th June, 1958, for period of 12 months.

Applications, stating qualifications, nationality, age and experience, with copies of testimonials or names of 2 referees, to Hospital Secretary, from whom further particulars of appointment can be obtained.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required middle of July, 1958, for duties throughout the Group, mainly at Royal Infirmary, Blackburn. Residence at Royal Infirmary, Blackburn. Post recognised for D.A. and F.F.A. R.C.S.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, giving names of 2 referees.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Locum JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (Casualty and Orthopædics) required for 1 week commencing 28th May, 1958.

Inquiries to Group Secretary, Royal Infirmary, Blackburn. Telephone 7133.

BLACKBURN. ROYAL INFIRMARY. Blackburn and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required 7th July, 1958. Recognised for F.R.C.S. and approved for pre-registration purposes.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BODMIN, CORNWALL. ST. LAWRENCE'S HOSPITAL. (Mental—1250 Beds.) Locum JUNIOR HOSPITAL MEDICAL OFFICER required for period of not less than 1 month commencing 1st July, 1958. Salary £19 5s. per week. Residence charges £170 p.a.

Applications to the Group Secretary/Finance Officer, St. Lawrence's Hospital, Bodmin.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer grade). Main duties at Bolton Royal Infirmary and Bolton District General Hospital. Now vacant, tenable for 12 months and recognised for the D.A. and F.F.A. R.C.S.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOLTON. THE ROYAL INFIRMARY. (237 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER for Casualty Department, with some orthopædic duties. Recognised for F.R.C.S. Junior Hospital Medical Officer post can be for any period of up to 4 years.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOSTON. GENERAL HOSPITAL. (80 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 2nd June, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON for general surgery. The post which becomes vacant on 31st May, 1958, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN. The appointment, which becomes vacant on 5th August, is recognised for pre-registration purposes.

Applications to the Hospital Secretary.

BRADFORD. ST. LUKE'S HOSPITAL. (724 Beds.) HOUSE SURGEON (general surgery/plastic) required. Recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience, and nationality, with copy testimonials, to Secretary, Bradford Royal Infirmary, Bradford, Yorkshire.

BRADFORD. ST. LUKE'S HOSPITAL. (724 Beds.) House PHYSICIAN (pædiatrics) required. Recognised for pre-registration purposes.

Applications, stating age, qualifications, experience and nationality, with copy testimonials, to Secretary, Bradford Royal Infirmary, Bradford, Yorkshire.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) CASUALTY HOUSE SURGEON required mid-June. Duties include work in Orthopædic and Traumatic Unit. Recognised for pre-registration and F.R.C.S.

Applications, stating age, qualifications, &c., and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) HOUSE SURGEON required end May. Pre-registration and recognised for F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Applications invited for 2 posts of SENIOR HOUSE OFFICER in the Regional Department of Thoracic Surgery (100 Beds) at Frenchay Hospital. The posts provide experience in all branches of cardiac, œsophageal and pulmonary surgery and the appointments are recognised for the Fellowship examinations of the Royal College of Surgeons. 1 post vacant 1st July, 1 1st August.

Applications, stating age and experience and naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol.

BROMLEY. LENNARD HOSPITAL AND FARN-BOROUGH HOSPITAL, KENT. HOUSE PHYSICIAN required 17th June for Geriatric Unit with beds at the Lennard and Farnborough Hospitals. Excellent experience in investigation and treatment of acute and chronic diseases in the elderly, and good facilities for reading. Opportunity for experience with children (infectious diseases) at the Lennard Hospital.

Apply, stating full particulars, and naming 2 referees, to Administrative Officer, Bromley Hospital, Bromley, Kent, by 3rd June.

BURTON-ON-TRENT GENERAL HOSPITAL. Applications are invited for the following pre-registration appointments, which become vacant during June and July, 1958 :—

HOUSE SURGEONS (general).

HOUSE SURGEON (gynæcology and obstetrics).

Recognised for F.R.C.S.

Apply Group Secretary, The General Hospital, Burton-on-Trent.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery. Post recognised for F.R.C.S.

Apply, stating full details as to experience, qualifications, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Medicine.

Apply, stating full details as to experience, qualifications, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics for duties at Hospitals in the above Group. Post recognised for D.A. examinations.

Apply, stating full details as to experience, qualifications, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (pathology). Post vacant mid-May.

Apply, stating age, qualifications, experience, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary, Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (262 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required for casualty duties. Salary £852 10s.–£55–£1182 10s. a year. A Senior House Officer is also employed.

Inquiries and applications to Hospital Secretary.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Regis-TRAR in Pædiatrics (non-resident) for 1 year in the first instance from mid-July, renewable for second year. Duties include pædiatric responsibilities at Cambridge Maternity Hospital.

Apply, with full particulars and names of 3 referees, to Secretary by 31st May.

CAMBRIDGE. THE UNITED CAMBRIDGE HOS-PITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. CASUALTY OFFICER, Senior House Officer grade, 1 year from mid-June, non-resident, is desired.

Apply to the Secretary, stating age, nationality, qualifications and experience, with dates, and with copies of 3 testimonials, by 4th June.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER (resident) required immediately in Geriatric Unit (200 Beds) at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. (586 Beds.) Applications invited for 2 vacancies as RESIDENT SENIOR HOUSE OFFICERS, as from 1st August, 1958, in acute medical wards, to work under direction of Consultants.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, Cardiff. There is a vacancy for a SENIOR HOUSE OFFICER at this Hospital, which has 240 Beds, for the treatment of tuberculosis —both pulmonary and non-pulmonary—and allied chest conditions. Experience available in thoracic surgery and operative treatment of bone and joint, genitourinary, and glandular tuberculosis.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF. ROOKWOOD HOSPITAL. Senior House OFFICER (surgical) required at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF (near). PRINCE OF WALES ORTHOPÆDIC HOSPITAL, RHYDLAFAR, near CARDIFF. SENIOR HOUSE OFFICER required at above Hospital. Married or single accommodation available.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN is now vacant at Stodmarsh Road Annexe. Duties include care of 30-Bedded unit of chest diseases, also work at the Chest Clinic and with the Pneumoconiosis Unit. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARLISLE. CUMBERLAND INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics).

Applications should be sent immediately to the Group Secretary, Cumberland Infirmary, Carlisle.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the posts of :—

(*a*) Locum SENIOR HOUSE OFFICER (medical) for months of June and July.

(*b*) Locum ANÆSTHETIST (Senior House Officer or Junior Hospital Medical Officer grading) for months of June, July and August.

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent as soon as possible.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. 2 HOUSE SURGEONS (posts approved for pre-registration service).

(*a*) General surgery with duties in E.N.T. Vacant now.

(*b*) General surgery only. Vacant mid-June.

Applications, stating for which post and giving age, qualifications, &c., with copies of recent testimonials or the names and addresses of 2 referees, to the Secretary at above address.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. Whole-time CASUALTY REGISTRAR (non-resident). To supervise the work of the Casualty Department. Post recognised for F.R.C.S. Vacant 13th August. Further information from the Physician-Superintendent, with whom arrangements to visit Hospital can be made.

Forms of application, returnable by 7th June, obtainable from Group Secretary at above address.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. ORTHOPÆDIC AND CASUALTY OFFICER (Senior House Officer). Post recognised for F.R.C.S. Vacant 14th June.

Applications, stating age, qualifications and experience, with copies of testimonials and the names of 2 referees, should be sent to the Group Secretary at above address.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required (pre- or post-registration). The post offers a wide experience in general surgery, gynæcology, and orthopædic surgery. Post recognised for the F.R.C.S.

Apply, with names of 2 referees, to the Secretary, General Hospital, Cheltenham.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male and Female practitioners for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST which will be vacant in September, 1958. Salary and conditions of service in accordance with Whitley Council regulations.

Applications, with names of referees and full details, to S. T. DAVIS, Group Secretary, General Hospital, Cheltenham.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, pre-registration post, to work in the general medical wards of the Hospital. Duties will commence on 14th June.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Locum REGISTRAR in Obstetrics and Gynæcology required for the period 9th June until 22nd June, 1958, inclusive.

Applications, with full particulars, to the Group Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. (65 surgical beds.) Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Senior House Officer grade) at above Hospital. The post, which becomes vacant on 7th June, 1958, is recognised for the F.R.C.S., and the successful candidate will gain excellent experience in general surgery, with good opportunity for preparation for higher qualifications. A House Surgeon is in residence.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to be received not later than 27th May, by the Secretary, Hospital Management Committee, Chelmsford Group, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Applications are invited from registered practitioners for the post of RESIDENT PÆDIATRIC HOUSE OFFICER (Male or Female), commencing as soon as possible. To work in the Pædiatric Unit of the Chelmsford Hospital Group. The Unit includes a Premature Baby Nursery of 10 Cots, and a Neonatal Department in the maternity block of the Hospital. The Department is recognised for the D.C.H.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, should be forwarded immediately to the Group Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer (intern) grade). 100 orthopædic beds. Post recognised for F.R.C.S. and pre-registration service. Salary in accordance with terms and conditions of National Health Service. Post vacant 28th May, 1958.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, Surrey.

CHESTERFIELD. SCARSDALE HOSPITAL. (72-Bed maternity unit.) SENIOR HOUSE OFFICER (obstetrics and gynæcology) required 1st July at above Hospital. Post recognised for M.R.C.O.G. and D.Obst.R.C.O.G. purposes. National salary and conditions.

Please apply M. H. BOONE, Group Secretary, Chesterfield Hospital Management Committee, at Chesterfield Royal Hospital.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at Royal West Sussex Hospital, Chichester (202 acute beds). Appointment mainly for casualty duty and recognised for F.R.C.S. House staff of Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £819 10s. p.a. less residential charge. Vacant mid-June, 1958.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for:—

Black Notley Hospital, Braintree, Essex (522 Beds)

Post of HOUSE OFFICER (orthopædic surgery). Duties include care of cases from London Hospital Orthopædic Department. Pre-registration or third post, tenable for 6 months. Recognised for F.R.C.S.

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds)

Post of SENIOR HOUSE OFFICER. Duties include medical, surgical, and casualty work. Post tenable for 6 months or 1 year.

Post of REGISTRAR (temporary) as Resident Casualty Officer during summer for period not exceeding 6 months.

Essex County Hospital, Colchester, Essex (181 Beds)

Post of HOUSE OFFICER to E.N.T. and Pædiatric Departments. Post tenable for 6 months. Post-registration appointment. Recognised for D.L.O. The Pædiatric Department consists of a new unit of 24 Beds.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH, SUSSEX. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (general surgery). Post, recognised for Fellowship, now vacant. Tenable 6 months in the first instance.

Applications, stating age, qualifications, nationality and experience, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT SENIOR HOUSE OFFICER (general surgery) required.

Applications, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. RESIDENT JUNIOR HOUSE SURGEON (general surgery). Pre-registration post now vacant. Tenable 6 months. Health Service conditions.

Applications, stating age, nationality and experience, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOUSE SURGEON (Orthopædic and Traumatic Unit). Post vacant end of May. Not pre-registration.

Applications, giving age, nationality, qualifications and experience, with names of 2 referees, to Hospital Secretary.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. RESIDENT JUNIOR HOUSE OFFICER (obstetrics and gynæcology), pre-registration post. Vacant 5th July. Tenable 6 months in first instance.

Apply, stating age, nationality and experience, with names of 2 referees, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (396 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 2nd June, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (general surgery), resident. Appointment from 1st June for 6 months. Recognised for F.R.C.S.

Applications, stating full details and 2 names for reference, to Secretary.

DEWSBURY, YORKSHIRE. STAINCLIFFE GENERAL HOSPITAL. (304 Beds.) Applications are invited for the pre-registration appointment of HOUSE OFFICER (general surgery) which is tenable for 6 months and is now vacant. There is a Surgical Unit of 52 Beds, and 7 resident medical staff.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship and D.L.O.) Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department. Post vacant late June.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) SENIOR HOUSE SURGEON required at this busy general hospital. Suitable post for candidate seeking further clinical experience and reading for higher qualifications. Recognised for F.R.C.S. 4 House Officer posts. National Health Service salary and conditions. Post becomes vacant early June.

Apply, giving usual particulars, and names of 2 referees, to the Secretary, Noble's Isle of Man Hospital, Douglas.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Locum SENIOR HOUSE OFFICER (anæsthetics) required from mid-May to 31st July. Resident or non-resident.

Apply to the Secretary, Noble's Isle of Man Hospital, Douglas.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) JUNIOR HOUSE PHYSICIAN, vacant now. Approved pre-registration post, but fully registered practitioners may apply. Duties to include geriatrics and acute medicine. Good general experience for first house appointment.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Corbett Hospital, Stourbridge (114 Beds)

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Guest Hospital, Dudley, Worcs.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (medical). Post vacant end of June, 1958.

Apply, Group Secretary, Guest Hospital, Dudley, Worcs.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) ORTHOPÆDIC REGISTRAR, Norfolk and Norwich Hospital (441 Beds). Post provides excellent training. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

(2) PÆDIATRIC REGISTRAR, Ipswich and East Suffolk Hospital. Recognised for D.C.H. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Ipswich and East Suffolk Hospital, Anglesea-road Wing, Ipswich.

(3) REGISTRAR in obstetrics and gynæcology, West Norfolk and King's Lynn General Hospital (146 Beds), King's Lynn. Post recognised for D.Obst.R.C.O.G. Single quarters available now. Married quarters will be available in approximately 6 months. Appointment for 1 year, renewable for second year. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, to be returned by 9th June, 1958.

EAST LOTHIAN HOSPITALS GROUP BOARD OF MANAGEMENT. EAST FORTUNE HOSPITAL, DREM, NORTH BERWICK. SENIOR HOUSE OFFICER, resident, required from 1st June, 1958. Married quarters available if required. The Hospital has 300 Beds in action, covering tuberculosis and chest conditions, and the work includes a limited amount of thoracic surgery.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, to the Secretary, East Lothian Hospitals Group Board of Management, 31, Court-street, Haddington, by 24th May, 1958.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT HOUSE OFFICER required for Maternity Unit, Eastern General Hospital, for 6 months commencing 1st July, 1958.

Applications, with names of 2 referees, to the Medical Superintendent, Western General Hospital, Crewe-road, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT HOUSE SURGEON required for the Western General Hospital, commencing 1st July, 1958.

Applications, with names of 2 referees, to the Medical Superintendent, Western General Hospital, Crewe-road, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. SENIOR HOUSE OFFICER required for Department of Radiotherapy, Western General Hospital.

Applications, with names of 2 referees, to the Medical Superintendent, Western General Hospital, Edinburgh, 4.

ELLESMERE PORT HOSPITAL. Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade). This is an acute hospital (39 Beds) at which regular Consultant outpatient and operating sessions are held. The accommodation available is suitable for either a single or a married practitioner.

Applications, giving full details of qualifications and experience, should be forwarded to the Group Secretary, Chester and District Hospital Management Committee, 5, King's-buildings, Chester.

ENFIELD. WAR MEMORIAL HOSPITAL, Chase Side, ENFIELD, MIDDLESEX. RESIDENT SENIOR HOUSE OFFICER required immediately for general medical and surgical duties in acute general hospital of 61 Beds. 12 months' appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (anæsthetics). Resident. Post now vacant. Busy general hospital. Easy access to London. Good experience. Recognised for F.F.A.R.C.S. and D.A.

Applications, with copies of recent testimonials, to be sent immediately to the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex.

EPPING. ST. MARGARET'S HOSPITAL. House PHYSICIAN (pre-registration) to Consultant in General Medicine. Post vacant 15th July, 1958.

Applications, with copies of testimonials, 1 from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex, by 6th June, 1958.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER as Casualty Officer and Orthopædic House Surgeon. Duties to commence 25th June. Recognised for F.R.C.S.

Applications, with copies of 2 recent testimonials, to be sent to Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex, by 4th June, 1958.

EPPING. ST. MARGARET'S HOSPITAL. House Sur-GEON (pre- or post-registration) to very busy General Surgical Unit. Hospital within easy reach of Central London. Post vacant 15th July, 1958.

Applications, with copies of testimonials, including 1 from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex, by 6th June, 1958.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE PHYSICIAN required 8th June. Fully registered post. Duties at above Hospital and Annexes include general medicine, geriatrics, pædiatrics, and dermatology.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary, at above address.

EPSOM, SURREY. WEST PARK HOSPITAL MANAGE-MENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in Psychiatry at West Park Hospital (for all stages of nervous and mental disorders), Epsom, Surrey. Candidates may be of either sex. Single residential quarters available. All modern methods are practised and there are facilities for study for the D.P.M. Within easy reach of London.

Application forms obtainable from the Group Secretary to the West Park Hospital Management Committee, Epsom, Surrey, to whom they should be returned not later than 7th June, 1958.

GLASGOW. CARTLOCH HOSPITAL, Gartcosh, Glas-GOW. RESIDENT HOUSE PHYSICIANS (2) required from 1st August, 1958, for General Medical Unit of 104 Beds. Recognised pre-registration posts.

Applications, with particulars and names of 2 referees, by 7th June, 1958, to Medical Superintendent.

GLASGOW, N.W. RUCHILL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Infectious Diseases Department (450 Beds.) Excellent experience in infectious diseases and general medicine. Undergraduate and postgraduate teaching unit and regional centre for treatment of poliomyelitis.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to Physician-Superintendent.

GLASGOW, N.W. RUCHILL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Chest Department (medical unit). The department consists of 200 Beds for the treatment of pulmonary tuberculosis and other diseases of the chest. There is attached to the department a Thoracic Surgical Unit of 60 Beds. Facilities are available for postgraduate study and research.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to Physician-Superintendent.

GLASGOW. VICTORIA INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in Dermatology at the Victoria Infirmary.

Applications, with names of 2 referees, should be sent to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent place, Glasgow, C.1, forthwith.

GLASGOW. VICTORIA INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in Orthopædics for duties at the Victoria Infirmary and a large unit at the Victoria Auxiliary Infirmary at Philipshill. The post is resident at Philipshill and is vacant as from 1st July, 1958.

Applications, with names of 2 referees, should be sent forthwith to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

HEREFORD GENERAL HOSPITAL. (154 Beds.) **House** OFFICER (general surgery) required immediately. Pre-registration post. Hospital recognised by R.C.S. Duties include care of general surgical beds and in addition for 3 months of orthopædic beds and for 3 months of E.N.T. beds.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary, Victoria House, Eign-street, Hereford.

HALIFAX. ROYAL HALIFAX INFIRMARY. House OFFICER (pre-registration) required for E.N.T. and Eye Departments at the above Infirmary. Post vacant now.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HAREFIELD HOSPITAL, Harefield, Middlesex. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) for duties on the Thoracic Surgical Unit.

Applications, together with copies of 2 testimonials, to be sent to the Medical Director, Harefield Hospital, Harefield, Middlesex, by 6th June, 1958.

HAROLD WOOD HOSPITAL. Area Laboratory. Applications are invited for Locum REGISTRAR. Post now vacant. Accommodation available if required.

Applications to Area Pathologist from whom further details may be obtained.

HARROGATE GENERAL HOSPITAL, Yorkshire. (253 Beds.) HOUSE SURGEON (recognised F.R.C.S. and for pre-registration purposes), immediate vacancy.

Applications, with names of 2 referees, to Hospital Secretary.

HARTLEPOOLS HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for vacancies as HOUSE SURGEONS (Senior or pre-registration. Recognised for F.R.C.S.) at Hartlepools Hospital, Hartlepool, and at the General Hospital, West Hartlepool.

Candidates should apply to the Group Secretary, General Hospital, West Hartlepool, as soon as possible, stating age, nationality and qualifications with dates, and copies of 2 testimonials.

HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum NON-RESIDENT MEDICAL OFFICER required. Post vacant now. Salary £19 5s. per week.

Apply, with full details of experience, with copies of 3 references or the names of 3 referees, to Group Secretary, 11, Holmesdale-gardens, Hastings.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON. Pre-registration post for general surgery and urology required at this acute hospital (surgical) on 1st June, 1958.

Applications, with names of 2 referees, to Administrator.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE SURGEON (pre-registration post) required. Post recognised for F.R.C.S. Staff of 5. Vacant now.

Applications immediately to Hospital Adminstrator.

HAYWARDS HEATH. HURSTWOOD PARK HOSPITAL. Locum Tenens SENIOR HOUSE OFFICER (neuro-surgical), resident, required as soon as possible. Salary in accordance with Whitley Council scale.

Applications as soon as possible to be sent to the Group Secretary, Hurstwood Park Hospital, Haywards Heath, Sussex.

HEMEL HEMPSTEAD, HERTFORDSHIRE. ST. PAUL'S HOSPITAL. HOUSE PHYSICIAN (pre-registration) required to commence 12th July, 1958.

Applications, giving details and enclosing copies of 2 recent testimonials, should be sent to the Hospital Secretary.

HENLEY-ON-THAMES, OXFORDSHIRE. PEPPARD CHEST HOSPITAL. (236 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital deals with all types of chest disease in medical and surgical wards. Previous experience in resident hospital appointments is desirable. Single accommodation is available.

Applications, stating age, qualifications and experience, with the names of 2 referees, should be forwarded to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general, first or second post) to commence 1st June, 1958. Pre-registration post; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HESWALL, CHESHIRE. CLEAVER HOSPITAL. (220 Beds.) CENTRAL WIRRAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER. Excellent facilities for obtaining good knowledge of modern treatment of pulmonary tuberculosis, including major surgery. The Hospital contains non-tuberculosis and children's units. Applicants should have held previous House appointments. Applications from ex-patient practitioners welcome. Salary £819 10s. p.a. (less £150 for emoluments). Terms and conditions of service for hospital medical and dental staff (England and Wales) will apply.

Applications to be submitted to Physician-Superintendent immediately.

HEXHAM GENERAL HOSPITAL. (304 Beds.) Applications are invited for the following House appointments, vacant 7th July, 1958. Pre- or post-registration vacancies. Applications will be considered from final-year students in anticipation of graduation and also from registered practitioners.

HOUSE PHYSICIAN.

HOUSE SURGEONS (3) (general, combined with orthopædics).

Hospital recognised by R.C.S. Large orthopædic unit providing excellent experience.

Applications, with names of 2 referees, to Group Secretary, General Hospital, Hexham, Northumberland.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOSPITAL. RESIDENT HOUSE SURGEON in Obstetrics and Gynæcology required for 6 months from 23rd June. Duties include the maternity wards (42 Beds) and gynæcological ward (20 Beds). The post is recognised for the D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. RESIDENT HOUSE PHYSICIAN required 12th June. Recognised as pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN. Recognised pre-registration appointment for 6 months. Vacant 19th June, 1958.

Applications, stating qualifications and age, together with copies of up to 3 recent testimonials or names for reference, to the Hospital Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties on 1st July, 1958. Salary in accordance with national scales.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.

The Royal Infirmary, Huddersfield.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (235 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade) at the above Hospital, to commence on 1st June, 1958. The Hospital caters for chronic sick, children, maternity, and acute medical and surgical patients. Salary in accordance with the terms and conditions of service for hospital medical and dental staff, £819 10s. p.a.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.

The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration post). Resident, and tenable for 6 months. This post includes gynæcology and general surgery.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. (115 Beds.) HOUSE SURGEON required on 1st August, 1958. Pre-registration or registration post. Recognised for D.C.H. An interesting and varied post which includes outpatient and casualty work.

Applications, together with details of experience, testimonials, &c., to the Hospital Secretary.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN—Pædiatric Unit. Duties at Victoria Children's Hospital for 3 months followed by 3 months on the pædiatric wards, Western General Hospital. An interesting and varied post which includes outpatient and casualty work. This appointment, which commences on 1st August, 1958, is recognised for the D.C.H.

Apply, giving experience, testimonials, &c., to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

ILKLEY. SCALEBOR PARK, BURLEY-IN-WHARFEDALE, ILKLEY. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) at Scalebor Park, a modern hospital of 396 Beds (amenity, Health Service, and private) for the active treatment of nervous and mental disorders. The Hospital is associated for teaching purposes with the Department of Psychiatry of Leeds University, and facilities will be granted for attending the D.P.M. course. The salary is in accordance with the Whitley Council scales. Accommodation is available for a single person.

Applications to the Physician-Superintendent immediately.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for approved pre-registration post of HOUSE PHYSICIAN, vacant on 2nd June, 1958.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to Hospital Secretary as soon as possible.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-road WING), IPSWICH. (280 Beds.) HOUSE PHYSICIAN (pre-registration). Post vacant 6th June.

Applications, with copies of 3 recent testimonials, to Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (129 Beds for infectious diseases, pulmonary tuberculosis, long-stay orthopædics and geriatrics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea-road Wing), Ipswich.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (General—139 Beds.) 2 RESIDENT HOUSE SURGEONS (either sex).

General surgery and E.N.T., vacant 1st July.

General surgery and orthopædics, vacant 10th June.

Both recognised for F.R.C.S. and approved pre-registration appointments, tenable for 6 months in first instance. 4 residents on staff.

Applications, with full particulars as to age, nationality and qualifications, and copies of 2 testimonials, to Group Secretary, Hospital Management Committee, 17, St. John's Hospital, Fell-lane, Keighley.

KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN (pre-registration), vacant 1st June, 1958.

Applications, stating age, experience and qualifications, together with 3 recent testimonials, to be sent to the Group Secretary, General Hospital, Kettering.

KETTERING AND DISTRICT GENERAL HOSPITAL, NORTHAMPTONSHIRE. Applications are invited for the post of HOUSE SURGEON (pre-registration), which becomes vacant on 1st June, 1958 Post recognised for F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KENDAL. WESTMORLAND COUNTY HOSPITAL. (85 Beds.) SENIOR HOUSE OFFICER (obstetrics and gynæcology). The post is resident or non-resident, and normally tenable for 1 year. Successful applicant will be attached to the Specialist Unit.

Applications, with full particulars and names of 2 referees, to be addressed to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Medicine

(*a*) Huddersfield Group (70 general medical beds). Non-resident.

(*b*) Pontefract and Castleford Group (65 general medical beds). Married accommodation available.

(*c*) Wakefield A Group (74 general medical beds) with additional duties in the Wakefield B Group. Furnished flat available.

General Surgery

St. James's Hospital, Leeds (124 general surgical beds).

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 4th June, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General/Orthopædic Surgery

For duties in the Halifax Group. 1 of 3 similar posts. Duties divided between general and orthopædic surgery (180 general surgical and 81 orthopædic surgery beds). May include some duties in the Casualty Department. Preferably resident.

Obstetrics and Gynæcology

Hull A and East Riding Groups (117 gynæcological and 144 obstetrical beds). Preferably resident. This post is 1 of 3 Registrar posts in obstetrics and gynæcology in the Hull area, and duties will rotate between :—

(*a*) Hull Royal Infirmary, Sutton (Gynæcological Unit).

(*b*) Hull Maternity Hospital (duties mainly obstetrical), and

(*c*) Western General Hospital, Kingston General Hospital (duties mainly gynæcological) and occasional duties at hospitals in the East Riding Group.

Psychiatry

Storthes Hall Hospital, Huddersfield (2750 Beds). Facilities for attendance at the Leeds University will be provided if the successful candidate is studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 28th May, 1958.

LEEDS. THE UNITED LEEDS HOSPITALS. THE GENERAL INFIRMARY AT LEEDS. SENIOR REGISTRAR in Diagnostic Radiology required for 1 year in the first instance; appointment renewable thereafter. Diploma in Radiology essential and higher qualifications in medicine, surgery, and radiology desirable. Terms and conditions of service for hospital medical staff apply.

Applications, giving details of age, education, qualifications and previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, before 7th June, 1958.

LEEDS, 7. CHAPEL ALLERTON HOSPITAL. (228 Beds.) SENIOR HOUSE OFFICER (medical) required. National Health Service terms and conditions.

Apply Medical Superintendent.

LINCOLN. ST. GEORGE'S HOSPITAL. (242 Beds.) LINCOLN NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN at the above Hospital, vacant from 1st May. Duties include acute medical, acute chest and pædiatrics.

Applications, giving full particulars and names for reference, should be addressed to the Secretary.

LIVERPOOL, 9. AINTREE HOSPITAL. Fazakerley GROUP OF HOSPITALS MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (medical). Applications are invited from registered medical practitioners. The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with the terms and conditions of service for hospital medical staff.

Applications endorsed "Resident Senior House Officer" to be submitted immediately to the Physician-Superintendent.

LIVERPOOL, 9. AINTREE HOSPITAL. Fazakerley GROUP OF HOSPITALS MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthesia. Applications are invited from registered medical practitioners. The Hospital is for the treatment of pulmonary and non-pulmonary tuberculosis and is a main centre for thoracic surgery and has an Orthopædic Department. Salary will be in accordance with terms and conditions of service for hospital medical staff.

Applications endorsed "Senior House Officer in Anæsthesia" to be submitted immediately to the Physician-Superintendent.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for a post of SENIOR REGISTRAR in Dermatology for the period 1st October, 1958, to 30th September, 1959. Annual reappointment until completion of the normal period of training will be considered thereafter without the need for further application. The person appointed will undertake the major part of his duties in the teaching hospitals, but there are also regular duties in non-teaching hospitals.

Apply by 7th June on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of SENIOR REGISTRAR in Otorhinolaryngology for the period 1st October, 1958, to 30th September, 1959. Annual reappointment until completion of the normal period of training will be considered thereafter without the need for further application.

Apply by 7th June on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LLWYNYPIA HOSPITAL, Llwynypia, Rhondda. Ponty-PRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (medicine) required immediately. The person appointed will be required to undertake duties at the Llwynypia Hospital (40 acute medical beds and 78 chronic sick beds), Glyncornel Hospital (56 chronic sick beds), and Tyntyla Isolation Hospital (42 Beds).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent immediately to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

LUTON AND DUNSTABLE HOSPITAL. Children's ANNEXE, LUTON, BEDFORDSHIRE. RESIDENT PÆDIATRIC HOUSE OFFICER required mid-June. The post is recognised for the D.C.H. and as a second pre-registration post in medicine. The duties include both medical and surgical wards.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton.

MACCLESFIELD HOSPITAL—Infirmary Branch. Pre-registration HOUSE OFFICER in Surgery. Acute Surgical Unit of 100 Beds. Recognised for F.R.C.S. purposes. Main casualty duties undertaken by Senior Resident Practitioner.

Apply immediately to Group Secretary, Macclesfield and District Hospital Management Committee, Willerby House, Cumberland-street, Macclesfield.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months' appointment. Vacant now. Recognised for F.R.C.S. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MANCHESTER, 4. ANCOATS HOSPITAL. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer). This is a busy General Hospital with a bed complement of 153 comprising general medicine, general surgery, traumatic and orthopædic surgery, and E.N.T. It has a busy Outpatient and Casualty Department with annual attendances at the Casualty Department of 9600. This post is recognised for F.R.C.S., and offers wide experience with ample opportunities for study. Vacant 26th May, 1958.

Applications, with names of 2 referees, by 3rd June 1958, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) RESIDENT SENIOR HOUSE OFFICER (surgical). Duties orthopædic and E.N.T. Post vacant 1st August.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

MANCHESTER REGIONAL HOSPITAL BOARD. Royal INFIRMARY AND QUEEN'S PARK HOSPITAL, BLACKBURN. REGISTRAR, Department of Psychological Medicine. Opportunity for wide experience in the treatment of inpatients and outpatients in general hospitals (including psychiatric inpatients in general medical wards) under direction of Consultant Psychiatrist. Modern, self-contained flat available suitable for married man. Recognised for D.P.M. by Conjoint Board and Manchester University. Facilities for attending D.P.M. course, Manchester University, and studying for higher qualifications. Services of Social Worker and Mental Health Workers.

Application forms from Group Secretary, Royal Infirmary Blackburn, returnable by 1st June, 1958.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in General Surgery (recognised for F.R.C.S.(Eng.)) in the Ashton, Hyde and Glossop Group of hospitals. Vacant 1st July, 1958.

Applications, stating age, nationality, qualifications and experience with copies of 2 references, should be forwarded to the Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancashire, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. Non-RESIDENT SENIOR REGISTRAR in Psychiatry to the Psychiatric Unit at Crumpsall Hospital, Manchester, 8. Duties include attendance at Consultant Psychiatric Clinics and participation in treatment of inpatients and outpatients. Facilities for gaining experience in child psychiatry will be afforded at the nearby regional centre. The person appointed may later be required to rotate to other hospitals in the area to gain wider experience.

Application forms from the Senior Administrative Medical Officer of the Board, Cheetwood-road, Manchester, 8, to be returned by 4th June, 1958.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Department which will become vacant on 1st June, 1958. Resident or non-resident. Duties are primarily in the active medical wards. Excellent experience is available in the unit which has been developed on modern lines and has available full general hospital facilities.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (medical) at Withington Hospital, vacant 2nd August, 1958.

Details of previous experience and names of 2 referees should be forwarded to the Group Secretary immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties, vacant on 17th July, 1958. The post is recognised by the Royal College of Surgeons for the final F.R.C.S. examination, and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the Manchester University for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary as soon as possible.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of Locum Tenens SENIOR HOUSE OFFICER (medical) for a period of 2 months from 17th July, 1958.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, immediately.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of REGISTRAR. Whole-time post (non-resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications to be made as soon as possible on forms obtainable from the undersigned. H. R. NORTH, General Superintendent.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), vacant 21st July, 1958. The post offers opportunity for training in all branches of pathology. Previous experience is not required.

Apply, with full details and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MIDDLESBROUGH GENERAL HOSPITAL, Ayresome Green-lane, MIDDLESBROUGH. (305 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (casualty) at the above Hospital. The post offers excellent experience in a very busy department for which there is a whole-time Senior Casualty Officer and 2 whole-time Senior House Officers.

Applications, giving full details, and with names for reference, should be addressed to the Hospital Secretary.

MIDDLESBROUGH. POOLE HOSPITAL, Nunthorpe, MIDDLESBROUGH. (Chest Diseases—310 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER for general duties on medical and surgical wards (adults and children). Salary and conditions of service in accordance with the Ministry of Health regulations. This Hospital is a most modern one with an active Thoracic Surgery Unit.

Applications, stating age, qualifications and previous experience, together with the names of 3 referees, to be sent immediately to the Hospital Secretary, Poole Hospital, Nunthorpe, near Middlesbrough, Yorks.

MITCHAM. CUMBERLAND HOSPITAL, Whitford-gardens, MITCHAM, SURREY. (100 Beds.) REGISTRAR in Tuberculosis (Medical Officer). Resident; or non-resident if within 5-mile radius of Hospital. Duties also in Thoracic Unit, St. Helier Hospital. Experience in specialty essential. Post vacant 15th August.

Forms of application, returnable by 7th June, obtainable from the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT HOUSE PHYSICIAN (not pre-registration). Vacant 1st July.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to the Secretary at above address.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (medical) required for above Hospital situated on Great North-road, approximately 20 miles from Nottingham. Post offers good experience. Consultant staff attending Newark Hospital are on 1 or more of the Nottingham Hospitals. Flat available as married quarters. Salary and conditions of service in accordance with Ministry regulations. Duties to commence about 29th April, 1958.

Applications, giving names of 3 referees, should be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for 2 posts of HOUSE PHYSICIAN, vacant 13th and 20th June, 1958. Duties include house charge of general medical and pulmonary tuberculosis beds. The posts are recognised for pre-registration, are resident and tenable for 6 months. Salary in accordance with national scale.

Applications, with 3 recent testimonials, to Medical Superintendent.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery). Resident. Recognised for F.R.C.S diploma.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) New-CASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER, Orthopædic Department. Vacant 7th July, 1958.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) The following resident posts become vacant on 7th July, 1958:—

* HOUSE PHYSICIANS (4), General Medical Wards. (2 of these posts rotate with the House Physician post in the Cardiovascular Department.)

* HOUSE PHYSICIAN (1), Cardiovascular Department. (This post rotates with the 2 House Physician posts in General Medicine.)

* HOUSE PHYSICIAN (1), Geriatric Unit.

* HOUSE SURGEONS (2), General Surgery (recognised for the F.R.C.S. Diploma).

* HOUSE SURGEON (1), Accident and Admission Department (recognised for F.R.C.S. Diploma).

* These posts are recognised for the purpose of pre-registration service and applications will be accepted from students on the point of taking their qualifying examination.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, by 7th June, 1958.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) WALKERGATE HOSPITAL. (309 Beds.) HOSPITAL FOR SICK CHILDREN. (106 Beds.) The following resident posts become vacant on 7th July, 1958:—

HOUSE PHYSICIANS (5) (pædiatrics), Hospital for Sick Children, Newcastle upon Tyne (2), Children's Department, Newcastle General Hospital (2), and Walkergate Hospital (1).

(3 of the posts are for pre-registration candidates (medical and surgical).)

The posts offer experience in the whole of the pædiatric work of the hospitals, including general medicine and surgery and the special departments. There is a close association with the University Department of Child Health. Applications for the pre-registration posts will be accepted from students on the point of taking their qualifying examination.

Applications, together with copies of 2 testimonials, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, by 7th June, 1958.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) New-CASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general medicine). Vacant 1st September, 1958. The successful candidate will have opportunity for clinical experience in inpatient and outpatient work, including a diabetic clinic.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST, whole-time, resident, for North West Durham Group of hospitals—main hospitals, Shotley Bridge General (41 gynæcology beds), Richard Murray (31 obstetric beds). Post available beginning of July. Recognised for M.R.C.O.G. examination. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE UPON TYNE HOSPITAL MANAGE-MENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Departments of Obstetrics and Gynæcology. Applications are invited for the following posts, vacant on 7th July, 1958:—

(1) **Newcastle General Hospital** (800 Beds)

Department of Obstetrics and Gynæcology (100 Beds). HOUSE SURGEONS (resident, pre-registration) (2).

This department is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment.

(2) **Hexham General Hospital** (304 Beds)

Gynæcology: HOUSE SURGEON (resident, pre-registration). Recognised for M.R.C.O.G. Applications considered from final-year students in anticipation of graduation.

(3) **Dilston Hall Maternity Hospital, Corbridge** (50 Beds)

Obstetrics: HOUSE SURGEON (resident, pre-registration). Recognised for D.Obst.R.C.O.G.

Applications, together with copies of 2 testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, by 7th June, 1958.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applica-tions are invited for the post of HOUSE OFFICER (obstetrics and gynæcology), recognised for pre-registration purposes, which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant on 2nd July, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applica-tions are invited for the post of SENIOR HOUSE OFFICER in the Department of Thoracic Surgery. Post vacant 29th June, 1958. Salary £819 10s. p.a. less £150 for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. Plastic Surgery, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER in Plastic Surgery. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from Nottingham and Derby areas. Salary £819 10s. less £150 board-residence. Post vacant 6th July, 1958.

Applications, together with copies of 3 testimonials, should be forwarded to the Hospital Secretary, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant immediately. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, vacant on 11th July, 1958. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM EYE HOSPITAL. Senior House Officer (ophthalmology) required. Duties to commence on 1st June, 1958. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration HOUSE PHYSICIAN required mid-June, 1958.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (medical) required. Duties to commence 9th June, 1958.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM. HEATHFIELD HOSPITAL, Hucknall-road, NOTTINGHAM. (Infectious Diseases.) Resident Locum MEDICAL OFFICER (Male or Female) required for holiday period of 8 weeks commencing 29th June, 1958. Junior Hospital Medical Officer rate of £19 5s. per week, less residential emoluments. Previous fever experience not essential.

Applications, with copies of 2 recent testimonials, as soon as possible to Physician-Superintendent.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER (obstetrics) in the Obstetrical and Gynæcological Departments, 48 obstetrical beds, 10 gynæcological beds, and a small block for puerperal pyrexia. This Hospital is recognised for training for the D.Obst.R.C.O.G. The appointment is for a period of 1 year commencing 7th July, 1958. Preference will be given to candidates who have experience in obstetrics and gynæcology. Salary and conditions of service will be in accordance with the Ministry's regulations.

Applications, stating age, experience, qualifications and nationality, with copies of 3 recent testimonials, to be sent to the Hospital Secretary.

OSWESTRY. ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL. SENIOR SURGICAL HOUSE OFFICER (resident) required to commence 1st August.

Apply Secretary by 13th June.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Vacancies exist in the following departments :—

HOUSE PHYSICIANS, vacancies 3rd and 15th July, 1958. Greenbank Road Hospital.

HOUSE PHYSICIAN, vacant 1st July, 1958. Freedom Fields Hospital.

HOUSE SURGEONS, vacancies 1st, 9th June, and 1st July, 1958. Recognised for the F.R.C.S. Pre-registration posts. Greenbank Road Hospital.

HOUSE SURGEONS, 2 vacancies, both on 1st July, 1958. Recognised for the F.R.C.S. Pre-registration posts. Freedom Fields Hospital.

In all cases send names of 3 referees, also stating age, nationality, qualifications and experience, to Group Secretary, 7, Nelson-gardens, Devonport.

PONTEFRACT GENERAL INFIRMARY. House Surgeon required. This is an approved pre-registration post under Medical Act, 1950, but applications will be considered from fully registered practitioners. Hospital approved under F.R.C.S. regulations and provides excellent surgical experience. Married accommodation available. Post vacant 8th June, 1958.

Applications, as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital (78 medical beds)

HOUSE OFFICER (pre-registration). Vacant 1st July, 1958.

Royal Portsmouth Hospital

Surgical (70 surgical beds).

HOUSE SURGEON (pre-registration). Vacant now.

Medical (61 medical beds).

HOUSE OFFICER (pre-registration). Vacant 19th July, 1958.

Orthopædic (104 orthopædic beds).

HOUSE OFFICER (pre-registration). Vacant 14th July, 1958.

St. Mary's Hospital

Medical (72 medical beds).

HOUSE OFFICER (pre-registration). Vacant 30th June, 1958.

Surgical (120 surgical beds).

HOUSE OFFICER (pre-registration). Vacant now.

HOUSE SURGEON (pre-registration). Vacant now.

Infectious Diseases Hospital

SENIOR HOUSE OFFICER for 12 months or Locum required with duties also on the tuberculosis wards and the Poliomyelitis Diagnostic and Respiratory Centre. Vacant immediately.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST, St. Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH. ST. JAMES HOSPITAL FOR MENTAL AND NERVOUS DISEASE. GROUP 49—SOUTH WEST METROPOLITAN REGION. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital is approved as a Psychiatric Teaching Hospital and the post offers excellent experience in the treatment of the neuroses, the psycho-neuroses, the maladjusted child and the problems of delinquency. The Neurological Department of the Hospital is also recognised by the examining bodies, and arrangements are made to enable junior medical staff to fulfil the D.P.M. regulations regarding mental deficiency. Intending candidates may visit the Hospital by appointment.

Applications, stating age, experience, qualifications, and the names and addresses of 2 referees, should be sent to the Physician-Superintendent within 14 days of the appearance of this advertisement.

PONTYPRIDD (near). EAST GLAMORGAN HOS-PITAL, CHURCH VILLAGE. (336 Beds and large Outpatient Department—serving population of 174,000.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology). Previous experience in pathology not essential. Emergency duties are shared with other residents.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd, as soon as possible.

PONTYPRIDD (near). EAST GLAMORGAN HOS-PITAL, CHURCH VILLAGE. (336 Beds and large Outpatient Department. Committee's base hospital serving population of 174,000. Recognised for D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A. R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgery).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent immediately to the Group Secretary, Courthouse-street, Pontypridd.

READING AREA DEPARTMENT OF MEDICINE. Applications invited from registered and provisionally registered medical practitioners for 2 RESIDENT HOUSE PHYSICIAN posts, for 6 months from 1st June. Successful candidates required to carry out duties at following Reading Hospitals : Royal Berkshire (397 Beds) and Prospect Park (104 Beds).

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Reading AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (pre- or post-registration) required in the Accident and Orthopædic Department.* F.R.C.S. recognised. Also casualty duties. Vacant 18th May, 1958.

Apply, stating age, qualifications with dates, nationality, present post, with copy of recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st June, 1958, and tenable for 6 months.

Write immediately, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL. SURGICAL REGISTRAR. Duties in general and orthopædic surgery, recognised for F.R.C.S. Married quarters available. Post vacant 1st July.

Application forms from Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Pendleton-road, Redhill, Surrey, returnable by 7th June.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (Male). Pre-registration appointment vacant immediately. Opportunity of House Physician's post to follow if required.

Applications to Hospital Secretary.

RICHMOND, SURREY. ROYAL HOSPITAL. (121 Beds.) KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified and experienced medical officers for the appointment of Full-time RESIDENT REGISTRAR (general surgery) which will become available shortly. Single or married quarters will be available.

Forms of application may be obtained from the Group Secretary (a foolscap stamped-addressed envelope to be enclosed), and the completed forms should be returned to the Group Secretary, 35, Coombe-road, Kingston-upon-Thames, within 14 days of the appearance of this advertisement.

RICHMOND, SURREY. ROYAL HOSPITAL. Pre-registration HOUSE SURGEON required 28th May, 1958, for busy acute general hospital (121 Beds) with full Consultant staff.

Applications invited immediately (acceptable in advance of examination results), giving age, qualifications, and names of 2 referees, to Administrative Officer.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required from 3rd June, 1958, in the Obstetric and Gynæcological Unit consisting of 88 obstetric and 52 gynæcological beds. Post recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.

Applications should be addressed to the Secretary, Romford Group Hospital Management Committee, at the Hospital as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required from 21st June, 1958. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. Locum ANÆSTHETIC REGISTRAR required for approximately 3 months from 2nd June, 1958.

Apply for further particulars by letter or telephone to Medical Superintendent. Telephone Romford 46090.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. Not pre-registration appointment.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.

St. James' Hospital, Tredegar, Monmouthshire. (38 general medicine, 43 chronic sick, and 43 obstetric beds.) Married quarters.

HOUSE PHYSICIAN (29th July).

OBSTETRIC HOUSE OFFICER (1st August)

Tredegar General Hospital. Surgical Unit of 50 Beds, plus 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty, and Radiology Departments. Married quarters.

HOUSE SURGEON (11th July) with opportunity to follow on with a House Physician or House Officer (obstetrics) if satisfactory.

Caerphilly District Miners Hospital, Caerphilly, Glamorganshire. (Acute general hospital, 226 Beds.) 6 miles from City of Cardiff; married quarters may be available; vacancies on 1st August.

2 HOUSE SURGEONS, 1 with duties also in Orthopædic Department. (Both recognised for F.R.C.S.)

HOUSE PHYSICIAN.

HOUSE OFFICER (obstetrics and gynæcology) (recognised for M.R.C.O.G. and D.Obst.R.C.O.G.)

Applications to the Group Secretary, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glam.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medicine) (Assistant Resident Medical Officer) required immediately at Birch Hill General Hospital. Resident staff includes Registrar (Resident Medical Officer) and 3 House Physicians.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (surgery) required late June at Rochdale Infirmary. Recognised for 6 months' F.R.C.S. experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHESTER, KENT. ST. BARTHOLOMEW'S HOSPITAL. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade). 1 of 2 in the department. Post vacant now and tenable for 6 months or 1 year. Recognised for F.R.C.S. Salary £819 10s. p.a.

Applications, stating age, nationality, qualifications and experience, with recent testimonials, to Hospital Secretary.

ROCHFORD GENERAL HOSPITAL. (620 Beds.) Applications are invited from pre-registration candidates for a 6-month appointment of HOUSE SURGEON (recognised for F.R.C.S.) to be followed, subject to satisfactory service, by a 6-month appointment as HOUSE OFFICER (obstetrics; recognised for D.Obst.R.C.O.G.). Post vacant 14th June, 1958.

Applications, accompanied by 1 testimonial, to reach the Secretary at the above Hospital, as soon as possible.

ROCHFORD GENERAL HOSPITAL. (620 Beds.) Applications are invited from pre-registration candidates for a 6-month appointment as HOUSE SURGEON (recognised for F.R.C.S.). Post vacant 1st June, 1958.

Applications, &c. (1 testimonial only necessary from pre-registration candidates seeking first appointment), to be sent to the undersigned at the above Hospital as soon as possible.

J. C. FIELD, Secretary.

ROCHFORD GENERAL HOSPITAL. (620 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration). Post vacant mid-June.

Applications, &c. (1 testimonial only necessary from pre-registration candidates seeking first appointment), to be sent to the Secretary at the above Hospital as soon as possible.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SENIOR HOUSE OFFICER (ophthalmic). Eye unit 35 Beds. Post recognised for D.O. Vacant 21st July, 1958.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. 2 REGISTRARS in the Regional Pool of Anæsthetists based on the Royal Infirmary of Edinburgh. The successful candidates will be seconded for periods of duty in peripheral hospitals, details of which may be obtained on application.

Apply, stating age, qualifications and previous experience and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 14th June, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Locum REGISTRAR in Surgery at Dunfermline and West Fife Hospital during August and September, 1958.

Apply, giving particulars of qualifications and experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 14th June.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Anæsthetics. Dundee Teaching Hospitals. Applications are invited for a post as SENIOR REGISTRAR in Anæsthetics at the Dundee Teaching Hospitals—Dundee Royal Infirmary (557 Beds) and Maryfield Hospital (370 Beds), the main general teaching hospitals associated with the University of St. Andrews. There will be associated with the appointment the post of Tutor in Clinical Anæsthesia in the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, Braeknowe, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 31st May, 1958.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Psychiatry based at Woodilee Mental Hospital, Lenzie, near Glasgow, which will be for 1 year in the first instance. A small flat is available.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 7th June, 1958.

SHEFFIELD. CITY GENERAL HOSPITAL. (658 Beds. Recognised for F.F.A. R.C.S.) **SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT or NON-RESIDENT REGISTRAR ANÆSTHETIST required 1st July. Successful candidate to reside at the Hospital when on call. This is a large general hospital with a Department of Thoracic Surgery, a Regional Cardiological Centre, and a Professorial Gynæcological Unit. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 2nd June, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. CITY GENERAL HOSPITAL. (658 Beds. Recognised for F.R.C.S.) **SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT or NON-RESIDENT REGISTRAR (thoracic surgery) required 6th July. Appointment for 1 year in first instance. The Hospital has a Regional Department of Cardiology. Thoracic Surgical Unit deals with tuberculous and non-tuberculous cases. Previous thoracic surgical experience desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 2nd June, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD, 5. CITY GENERAL HOSPITAL. Resident Locum SENIOR HOUSE OFFICER (general medicine) required from 1st June, 1958, for approximately 3 weeks. Rate of pay £15 19s. per week.

Apply, giving full details, to the Group Secretary, Sheffield No. 1 Hospital Management Committee, Lyndhurst, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts:—

(*a*) REGISTRAR in Thoracic Surgery at the Royal Infirmary. Post vacant 5th July, 1958.

(*b*) REGISTRAR to the Department of Radiology, Royal Infirmary/Royal Hospital.

Applications for above posts, with names of 3 referees, to the Chief Administrative Officer, United Sheffield Hospitals, Westcroft-street, Sheffield, 1, by 31st May, 1958.

(*c*) SENIOR HOUSE OFFICER in General Medicine, Royal Infirmary. Post vacant 1st August, 1958. Successful applicant will work principally in the Professorial Unit (therapeutics) at the Infirmary.

Applications, stating age, qualifications, and experience, with the names of 3 referees, should be sent not later than 14th June, 1958, to the Superintendent, Royal Infirmary, Sheffield, 6.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum CASUALTY REGISTRAR required 2nd–15th June.

Applications, with names of 2 referees, to Secretary.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds. Recognised for F.R.C.S.) ORTHOPÆDIC HOUSE SURGEON (pre-registration candidates eligible). Post offers excellent experience in the treatment of traumatic conditions.

Applications to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND GENERAL HOSPITAL. (262 Beds.) Applications are invited from registered or provisionally registered practitioners for 2 posts as RESIDENT HOUSE SURGEONS. 1 post now vacant; second post vacant 4th June, 1958.

Applications, stating age, qualifications and previous experience, with copies of recent testimonials (1 testimonial sufficient from applicants for first appointment), should reach the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHEND GENERAL HOSPITAL. (262 Beds.) Applications are invited for 2 posts of HOUSE PHYSICIAN (pre-registration) vacant 1st and 16th June, 1958.

Applications, stating age, qualifications, experience, &c., together with copies of recent testimonials, to be sent to the Secretary at the Hospital as soon as possible.

SOUTH WESTERN REGIONAL HOSPITAL BOARD AND UNITED BRISTOL HOSPITALS. Applications are invited by the above Boards for 2 joint appointments of REGISTRAR in Pædiatrics. The appointments will be held for 1 year in the first instance commencing on 1st September, 1958, and will be renewable for a further year. For the first year 1 of the successful candidates will work at the South Devon and East Cornwall Hospital, Plymouth, and the other will work in the United Bristol Hospitals with main duties in the Bristol Royal Hospital for Sick Children and the Bristol Maternity Hospital, a post in which the holder is normally appointed Tutor in Child Health in the University of Bristol. When the appointments are renewed for a second year, the 2 Registrars will interchange.

Applications, stating date of birth, qualifications and experience together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th May, 1958.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE SURGEON. Pre-registration post. Vacant 9th July. At end of service the successful applicant will be considered for appointment to a pre-registration post of House Physician if he or she has not held such an appointment.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (obstetrics and gynæcology). 6 months in the first instance, and previous obstetric experience necessary. Unit of 20 gynæcology beds and 17 obstetric beds dealing only with the complicated and emergency obstetrics of the Group. Married accommodation available.

Applications, giving details of qualifications and experience and names for reference, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 surgical teams. Post recognised for F.R.C.S. Post vacant 25th June, 1958, and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required for 1 of the 2 medical teams. Post vacant 3rd June, 1958, and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ASAPH HOSPITAL, St. Asaph, Flintshire. Appointment of HOUSE SURGEON. Duties divided between ophthalmology (16 Beds), E.N.T. (12 Beds), and oral surgery (4 Beds). Post vacant 1st June, 1958.

Applications, stating age, qualifications and experience, accompanied by 2 recent testimonials, to be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

STOCKPORT INFIRMARY. Locum Casualty Officer (Senior House Officer) required for 2 weeks commencing 30th June.

Applications with full particulars, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT INFIRMARY. (163 Beds.) Applications are invited for the post of HOUSE OFFICER or SENIOR HOUSE OFFICER (medicine). Vacant 8th July, 1958.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (685 Beds.) RESIDENT SENIOR HOUSE PHYSICIAN (pædiatric) required (Senior House Officer grade). Post vacant mid-June—12-month appointment. Post recognised for D.C.H.

Applications, with copy testimonials, to Hospital Secretary as soon as possible.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. Whole-time Locum Tenens SENIOR SURGICAL REGISTRAR. Wide experience specialty required. Salary £26 8s. per week, less emoluments.

Apply immediately, giving details of previous experience and naming 2 referees, to Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. SENIOR HOUSE OFFICER in General Surgery required (6 months' appointment). Hospital recognised for F.R.C.S. Post vacant very shortly.

Applications to Hospital Secretary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics) required. Post recognised for F.F.A. R.C.S. and D.A. Medical library facilities available.

Detailed applications to Hospital Secretary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. Post vacant very shortly.

Detailed applications, with copy testimonials, to Hospital Secretary, as soon as possible.

SULLY HOSPITAL, Sully, Glamorganshire. (Thoracic centre of 324 Beds.) SENIOR HOUSE OFFICER (surgical—applicants primarily interested in general surgery considered) also SENIOR HOUSE OFFICER (medical) required. With each post experience will be gained in investigation and treatment of chest and heart conditions.

Form of application stating post from Group Secretary, 44, Cathedral-road, Cardiff.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Thoracic Surgery Unit of the above Hospital. Unit has 60 Beds for all types of thoracic surgery including tuberculous, non-tuberculous, œsophageal, and cardiac, and is the centre for South West Wales.

Applications, stating age and full particulars, together with the names of 2 referees, to the Medical Superintendent of the Hospital. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glan-TAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum JUNIOR HOSPITAL MEDICAL OFFICER in the Casualty Department for the above Hospital for the period 10th–20th June, 1958.

Applications with full particulars should be sent to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glan-TAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of the above Hospital. Vacancy 1st June, 1958. The post is recognised for the F.R.C.S.(Eng.) and D.O. examinations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Hospital Secretary. T. E. JONES, Group Secretary.

STRATFORD ON AVON HOSPITAL. (163 Beds.) Resi-DENT HOUSE SURGEON. Post vacant 30th June, providing excellent experience.

Applications from fully registered or pre-registration applicants, with 2 recent testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 7th July. Pre-registration post.

Applications stating age, qualifications with dates, with copies of 2 testimonials to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of HOUSE PHYSICIAN to the Special Unit for Research in Juvenile Rheumatism, vacant 4th July. Post offers scope for those interested in research, pædiatrics, rheumatology, or cardiology.

Applications, stating age, qualifications and experience with dates, with copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. (423 Beds.) SENIOR HOUSE OFFICER (anæsthetics) required. Post vacant 13th June, 1958, is recognised for F.F.A. R.C.S. and D.A. A Registrar in Anæsthetics is also employed in the South Somerset Clinical Area, in which the above is the principal general hospital.

Applications, stating age, nationality, experience in anæsthetics (if any), together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, immediately.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. (423 Beds.) HOUSE OFFICERS (general surgery) required. 2 pre-registration posts recognised for F.R.C.S., vacant 30th June, 1958, and 8th July, 1958, respectively.

Applications, stating age, nationality and qualifications, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TORQUAY. TORBAY HOSPITAL. (166 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required for mid-June, 1958. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic, and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting Ref. F. 955/91), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WAKEFIELD. STANLEY ROYD HOSPITAL. Applica-tions invited for post of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER in Psychiatry. Accommodation available for a single person.

Address written applications, giving full personal particulars, details of training, experience, &c., and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WARLINGHAM PARK HOSPITAL. South West Metro-POLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a post of Whole-time PSYCHIATRIC REGISTRAR. The Hospital uses all modern treatment methods, emphasises social and group therapy, and conducts a complete mental health service for Croydon. Opportunity will be given for experience in all branches of inpatient and outpatient psychiatry, including group therapy, child guidance, and the treatment of alcoholism and delinquency. Single residential accommodation available. Intending candidates may visit the Hospital by arrangement with the Physician-Superintendent.

Application form obtainable from the Group Secretary, Warlingham Park Hospital, Warlingham, Surrey, should be returned within 14 days from the date of this advertisement.

WARRINGTON AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (geriatrics) (Male or Female) for active geriatric units at Whitecross Hospital and Aikin Street Hospital, Warrington. Good clinical experience and study time for higher qualifications. Scale of salary £819 10s. p.a., less a deduction of £150 p.a. for residential emoluments.

Applications to be forwarded to: HENRY L. BOOT, Group Secretary, c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. Applications are invited from Males and Females for the post of RESIDENT CASUALTY OFFICER (graded as Junior Hospital Medical Officer) at the above Hospital. The post is recognised for the F.R.C.S. Scale of salary £852 10s.–£55–£1182 10s. less a deduction of £170 for residential emoluments. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications, should be forwarded to:—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (211 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade) to the Watford Hospitals. Post vacant 1st July.

Applications, together with copies of not more than 2 recent testimonials, to the Administrator.

WARWICK HOSPITAL, Lakin-road, Warwick. (284 Beds.) SENIOR HOUSE OFFICER in Anæsthetics required on 1st July, 1958. The post is recognised for D.A. and F.F.A.R.C.S., and is resident.

Applications, with 2 recent testimonials, to be forwarded to the Medical Superintendent.

WARWICK (near). KING EDWARD VII MEMORIAL CHEST HOSPITAL. (Diseases of the chest. 228 Beds.) SENIOR HOUSE OFFICER, resident desirable. Hospital is modern with Thoracic Surgery Unit.

Applications to Medical Superintendent.

WELSH REGIONAL HOSPITAL BOARD. Registrar (plastic surgery), St. Lawrence Hospital, Chepstow (182 Beds). Expected to visit other hospitals in South Wales area. Considerable opportunities for training in specialty. Accommodation for single person. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments. Pre-registration.

West Bromwich and District General Hospital (144 Beds)

1 HOUSE PHYSICIAN.

Hallam Hospital, West Bromwich (430 Beds)

2 HOUSE PHYSICIANS.

These posts will be vacant 8th July, 1958.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments. Pre-registration.

West Bromwich and District General Hospital (144 Beds)

1 HOUSE SURGEON.

Hallam Hospital, West Bromwich (430 Beds)

2 HOUSE SURGEONS.

These posts will be vacant 8th July, 1958.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required, resident. New appointment. Duties mainly at 2 general hospitals. Recognised for D.A. and F.F.A.R.C.S. The post is tenable for 1 year.

Applications, with names of 3 referees, to be sent to the undersigned. J. O. ROBINS, Group Secretary,

West Bromwich and District General Hospital.

Edward-street, West Bromwich.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) Applications are invited from duly qualified medical practitioners for the pre-registration appointment of HOUSE SURGEON (resident). Vacancy 15th July, 1958.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WEYMOUTH AND DISTRICT HOSPITAL. House SURGEON (Male or Female) required for resident pre-registration post. Recognised for F.R.C.S. examination and tenable for 6 months.

Applications, stating age, qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. CASUALTY OFFICER required (Senior House Officer grade). Vacant now.

Applications, with full details, to Group Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan-lane, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. SENIOR HOUSE OFFICER for duty in the Paediatric Department at Wigan Infirmary with neonatal work at Billinge Hospital. Post recognised for D.C.H. Post vacant late June. Previous paediatric experience necessary.

Applications, with names of 2 referees, to the Secretary, Royal Albert Edward Infirmary, Wigan.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (327 Beds.) HOUSE SURGEONS (2) (posts recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration posts. 1 vacant immediately; the other vacant 1st June.

Applications, with copies of 2 testimonials, to Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (327 Beds.) HOUSE SURGEON to the Senior Surgeon. Post vacant immediately.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (327 Beds.) HOUSE PHYSICIAN (pre-registration). Vacant 1st July.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN (paediatrics) required, Male or Female, for post vacant 1st July. Pre-registration post—Hospital recognised for D.C.H. Successful candidate will be resident at Old Windsor Unit of the Hospital.

Applications, stating age, qualifications with dates, experience and nationality and copies of 3 testimonials, to Secretary.

WORCESTER ROYAL INFIRMARY. House Surgeon (pre-registration or otherwise) required immediately for Orthopædic Department of this busy general hospital of 213 Beds. The appointment offers wide and varied experience.

Applications to Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) SENIOR HOUSE OFFICER (anæsthetics). Post vacant 21st May. Recognised for D.A. and F.F.A. R.C.S. Flat available for married applicant.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) ORTHOPÆDIC SENIOR HOUSE SURGEON for Fracture and Orthopædic Department. Post recognised for F.R.C.S. Vacant immediately.

Apply, with 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS (general surgery). Vacancies occur 2nd, 9th, and 17th July. All posts recognised for F.R.C.S.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS (general medicine). Vacancies occur on 2nd and 9th July, and 1st August.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICER (pædiatrics). Post recognised for D.C.H. Vacant 27th July.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WORKINGTON INFIRMARY, Cumberland. (150 Beds, pre-registration post.) HOUSE OFFICER or SENIOR HOUSE OFFICER for orthopædic, surgical, and casualty duties. Vacant now.

Applications, with dates, and names of 2 referees, to Group Secretary.

WORTHING GROUP HOSPITAL MANAGEMENT COM-MITTEE. Vacant immediately: post of THORACIC MEDICAL REGISTRAR. Inpatient and outpatient work in 2 large general hospitals in all branches of thoracic medicine, with supervision of a small number of tuberculosis patients in a neighbouring hospital. Previous general medicine and chest experience necessary. Car essential.

Application forms are obtainable from the undersigned and should be returned within 21 days of the appearance of this advertisement. A. V. OAKTON, Group Secretary.

Worthing Group Hospital Management Committee,

129, Brighton-road, Worthing, Sussex.

YORK. COUNTY HOSPITAL. (General hospital of 266 Beds with full Consultant staff.) SENIOR HOUSE OFFICER in Ophthalmology required immediately. Post is recognised for D.O. and F.R.C.S. and may be resident or non-resident.

Applications, giving age, qualifications, experience, nationality, and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

YORK MILITARY HOSPITAL (Civilian Wing, 60 Beds). SENIOR HOUSE OFFICER required immediately, resident or non-resident. There are 30 general surgical and 30 medical beds. The Hospital is associated with the County Hospital (general, 266 Beds) where relief casualty and emergency work and relief work for House Surgeons may be undertaken, and where residence can be provided.

Applications, stating age, nationality, experience, qualifications and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOS-PITAL. The Board of Management invite applications from medical practitioners with the requisite postgraduate experience and qualifications for appointment as SENIOR REGISTRAR in Morbid Anatomy.

The salary offered is £1428 p.a., rising by 3 increments to £1596 p.a., plus an inducement addition payable to an expatriate doctor of £300 p.a.

Candidates should have had 3 years' experience in pathology.

The successful candidate will be expected to assume duty in October, 1958.

The appointment will be initially for 1 tour of 12 months and will be renewable by mutual agreement for a further tour of 12 months.

On satisfactory completion of the agreement, a gratuity of £37 10s. will be paid for each completed term of 3 months' service.

An outfit allowance of £60 is payable on first appointment.

Partly-furnished quarters are provided at a rental of 8½% of salary, excluding inducement allowance, and an expatriate doctor appointed will be eligible for 7 days' leave on full pay for each completed month of service in Nigeria. A Nigerian doctor is eligible for 5 days' leave for each completed month of service.

Free first-class passages are provided for expatriate doctors and their wives on first appointment and on completion of the agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for non-expatriate doctors. Free first-class passages will be provided for vacation leave.

Candidates will be eligible for children's allowances in accordance with existing regulations.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions, and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 7th June, 1958, on the appropriate forms, which will be forwarded, together with additional information on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

DUBLIN. ROYAL VICTORIA EYE AND EAR HOSPITAL. E.N.T. Department. HOUSE SURGEON, for above Department, required. Appointment for 1 year from 1st August, 1958. Salary £275 p.a., with free board, lodging, and laundry.

Applications, with testimonials, to be forwarded to the Registrar before 30th June, 1958.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as ASSISTANT MEDICAL OFFICER (Junior Hospital Medical Officer grade) to the Northern Ireland Blood Transfusion Service. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 11th June, 1958.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 year approved ROTATING INTERNSHIP beginning 1st July, 1958. 234-Bed General Hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Salary $200 if single, $250 if married. Housing rent-free.

Apply Director.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (383-Bed general community hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Internship and Residency training. Only graduates from approved university schools accepted. Internships available for the 1-year term commencing 1st July, 1958. Stipend is $200 per month plus complete maintenance.

Apply Superintendent.

Public Appointments

CIVIL SERVICE COMMISSION.

Ministry of Health

MEDICAL OFFICERS. 3 Headquarters posts for men or women aged 28 or more on 1st May, 1958. Must be registered medical practitioners with experience in public health service or comparable administrative or hospital experience. Diploma in Public Health desirable. Duties concerned with public health administration, epidemiology, and regional hospital aspects of the National Health Service.

Ministry of Health and Welsh Board of Health

REGIONAL MEDICAL OFFICERS. 6 posts in the Ministry of Health and 1 post in Wales for men or women aged 28 or more on 1st May, 1958. Must be registered medical practitioners with wide experience of general practice. Experience in medical boarding and occupational health an advantage. Knowledge of Welsh desirable for post in Wales. Duties: examining insured persons' incapacity for work, examining persons under the Disabled Persons (Employment) Act, 1944, and administrative duties arising out of the National Health Service.

Department of Health, Scotland

REGIONAL MEDICAL OFFICER. Edinburgh post for registered medical practitioner who must have been fully qualified for at least 10 years and had wide experience of general practice.

Ministry of Pensions and National Insurance

MEDICAL OFFICERS. 3 provincial posts for men or women aged 28 or more on 1st May, 1958. Must be registered medical practitioners with good clinical experience. Experience in medical boarding or occupational health an advantage. Duties mainly concerned with claims for disablement benefit and war pensions.

PNEUMOCONIOSIS MEDICAL OFFICER post for man or woman aged 28 or more on 1st May, 1958. Must be a registered medical practitioner with special experience in chest work. Duties include membership of Pneumoconiosis Medical Panels and clinical examination of claimants to disablement benefit and supervision of radiographical work.

Prison Commission

MEDICAL OFFICERS. 6 posts for men aged 28 or more on 1st May, 1958. Must be registered medical practitioners with sound knowledge of medical and surgical practice, preferably with experience in psychological medicine. D.P.M. an advantage. Duties are mainly clinical. Medical Officers are responsible for the physical and mental health of persons in custody, the supervision of the hospital and general hygiene of the establishment; the provision of medical and psychiatric reports to the Prison Commissioners and the Courts. Opportunities for research into mental and physical disorders.

General Board of Control (Scotland)

MEDICAL OFFICER. Post for man or woman aged 28 or more on 1st May, 1958. Must be registered medical practitioner with special qualifications in psychiatry and experience in mental health work. Duties: to visit mental patients and mental defectives boarded out in private dwellings, and to assist in development of mental health service.

Starting salary (London) from £1390 at 28 to £2165 at 40 or over (exceptionally higher in appropriate cases). Scale maximum £2350. Promotion prospects, non-contributory pension, 5-day week in general. Interviews in London or Edinburgh.

Write Civil Service Commission, 6, Burlington-gardens, London, W.1, for application form, quoting No. 537/58. Closing date 9th June, 1958.

FACTORY DOCTORS. Factories Acts 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
POLESWORTH ..	WARWICK ..	.. 14TH JUNE, 1958

NAVY, ARMY, AND AIR FORCE INSTITUTES. Applications are invited from medical practitioners (Female) with a wide experience of general medicine for the part-time appointment (1 session weekly) of ASSISTANT MEDICAL OFFICER at the Headquarters of this Corporation.

Applications, stating age, nationality, qualifications and experience should be sent to Chief Medical Officer, Navy, Army, and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 27th May, 1958.

LONDON COUNTY COUNCIL. Applications invited from medical practitioners practising in locality under National Health Service for appointment as VISITING MEDICAL OFFICER to Anerley Residential School, S.E.20, accommodating 40 maladjusted children. Remuneration £70 a year plus fees receivable from Executive Council in respect of children and resident staff taken on National Health Service list.

Particulars and application forms from Medical Officer of Health (PH/D.1/885), County Hall, S.E.1. Closing date 2nd June, 1958.

LONDON COUNTY COUNCIL. Applications invited from medical practitioners practising in locality under National Health Service for appointment as VISITING MEDICAL OFFICER to Bowden House Residential School, Seaford, accommodating 60 educationally subnormal boys. Remuneration £70 a year plus fees receivable from Executive Council in respect of boys and resident staff taken on National Health Service list.

Particulars and application form from Medical Officer of Health (PH/D.1/886), County Hall, S.E.1. Closing date 5th June, 1958.

EDINBURGH. CITY OF EDINBURGH. Public Health DEPARTMENT. ASSISTANT MEDICAL OFFICER required by Child Welfare Department. Salary scale £1050–£50–£1200–£55–£1475.

Apply, giving particulars of experience, qualifications, age, and names of 2 referees, to the Medical Officer of Health, Johnston-terrace, Edinburgh, 1, within 14 days of the date of this advertisement.

GLASGOW. CORPORATION OF GLASGOW. Health AND WELFARE DEPARTMENT. Applications are invited for the whole-time appointment of MEDICAL ASSISTANT BACTERIOLOGIST. Applicants should preferably have some experience of routine bacteriology and serology, or, alternatively, hold a Diploma in Public Health. Salary scale £1050–£50 (3)–£55 (5)–£1475 p.a. The post is superannuable, subject to medical examination.

Applications, stating age, qualifications and experience, with names of 3 referees, should reach me by 28th May, 1958, in an envelope marked "Appointment of Medical Assistant Bacteriologist". WILLIAM KERR, Town Clerk.

City Chambers, Glasgow.

KENT COUNTY COUNCIL require Administrative ASSISTANT COUNTY MEDICAL OFFICER. Salary in scale £1200–£50(3)–£1350–£55(5)–£1625. Superannuable post. Duties will be partly administrative and partly clinical, concerned both with the School Health Service and the functions of the Health Committee.

Applications, stating age, qualifications, experience and the names of 2 referees as to professional ability and character, to the County Medical Officer, County Hall, Maidstone, by 7th June, 1958.

LANCASHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICER in the Lancaster area. Possession of Diploma in Public Health desirable. Salary £1050 rising to £1475 p.a. Travelling and subsistence allowances where applicable.

Application forms (to be returned by 11th June, 1958) and further particulars from County Medical Officer, Serial 822, East Cliff County Offices, Preston.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MEDICAL OFFICER (whole-time) required initially in Area 6 (Wembley and Willesden). Duties include supervision of health of mothers, young children and schoolchildren. Experience in these branches of public health work advantage. Salary £1050–£50 (3)–£55 (5)–£1475 p.a. Established, pensionable, subject to medical assessment. Prescribed conditions.

Apply, stating age, qualifications, experience, and names and addresses of 2 referees, to Joint Area Medical Officers, 215, Chevening-road, Kilburn, N.W.6, by 7th June (quote X.470TL). Canvassing disqualifies.

NATIONAL COAL BOARD. North Eastern Division. AREA MEDICAL OFFICER required in the South Barnsley Area. Experience in the field of preventive and industrial medicine and a knowledge of the coalmining industry an advantage. The work will include underground visits to collieries. Salary £1600–£2400 p.a.

Detailed applications, giving names of 2 referees, to Staff Director, National Coal Board, Holmwood House, Ecclesall-road South, Sheffield, 11, by 31st May, 1958. Mark envelopes "Staff Vacancy" and quote AA/360.

NORTHAMPTON COUNTY BOROUGH. Deputy Medical OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER (£1520–£55 (4)–£50 (1)–£1790).

Particulars and form of application, returnable by 9th June, from Medical Officer of Health, 7A, St. Giles'-square, Northampton. C. E. VIVIAN ROWE, Town Clerk.

WARWICKSHIRE COUNTY COUNCIL. County Medical OFFICER OF HEALTH'S DEPARTMENT. Applications are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH, which is in the Sutton Coldfield Area of the county. Preference will be given to those holding the D.P.H. or D.C.H. and with previous experience. Conditions of service and salary (£1050–£1475) will be in accordance with the Whitley Council. The successful candidate will be required to provide a motorcar in the performance of duties, for which Whitley Council scale allowances are payable. Consideration will be given to the granting of financial assistance towards removal expenses.

Further particulars, including details of duties, and application forms may be obtained from the County Medical Officer of Health, Shire Hall, Warwick. Closing date for applications is 14th June, 1958.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 9th May, 1958.

SOUTHEND-ON-SEA CORPORATION invite applications from qualified Women for appointment as SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER. The duties of the post are mainly clinical but some administrative responsibility, particularly for maternity and child welfare, might be given to a suitably experienced woman. Salary scale £1050–£1475 p.a. In determining the commencing salary proper regard will be given to qualification and experience.

Application forms and conditions of service may be obtained from the Medical Officer of Health, Municipal Health Centre, Warrior-square, Southend-on-Sea.

SOUTH CORK BOARD OF PUBLIC ASSISTANCE. Vacancy for OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR at St. Finbarr's Hospitals. Salary £862 10s. p.a.

Application forms and particulars may be obtained from the County Manager, Courthouse, Cork, with whom completed applications should be lodged not later than 5 P.M., on Friday, 13th June, 1958.

GOVERNMENT OF THE FEDERATION OF NIGERIA. MEDICAL OFFICERS required in the Southern Cameroons Medical Services for administration of preventive medicine and clinical work of curative medicine. May be required to carry out general duties of Medical Officer and other duties in connection with epidemic diseases. Candidates should possess medical qualifications registrable in the United Kingdom. R practitioners may apply and, if appointed, will be granted indefinite deferment of call-up on completion of 2 years' service.

Appointment :—

(*a*) On short-term contract with inclusive salary from £1338 to £2286 p.a. On completion of contract gratuity (taxable) is paid of £37 10s. for each completed period of 3 months' service (including leave).

(*b*) From National Health Service with inclusive salary from £1128 to £1950 p.a., candidate retaining superannuation rights and receiving gratuity (taxable) of 20 % of aggregate of salary.

Quarters at low rental. Free return passages for officer and wife. Return passages for children, to age 18, provided cost does not exceed that of 2 adult return passages in any 1 tour of service. Children's (separate domicile) allowance of £75 a year for each child under 18, ceasing if children join parents in Nigeria. Income-tax at local rates. Local leave permissible and generous home leave after each tour.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/14/058).

HER MAJESTY'S OVERSEAS CIVIL SERVICE. British GUIANA. Applications invited from doctors with qualifications registrable in United Kingdom for following posts. Possession of a Diploma in Pathology or Bacteriology would be an asset for (*a*).

(*a*) PATHOLOGIST for New Amsterdam and Mental Hospitals, to have charge of laboratory staff, buildings and equipment, to supervise laboratories of Government hospitals and be responsible for training of laboratory technicians. Salary £1600 a year plus £250 a year (non-pensionable) in lieu of consultation fees.

(*b*) MEDICAL OFFICERS for usual duties of Government Medical Officer in any part of Colony. May first be under supervision of experienced Medical Officer in a public hospital. R practitioners, i.e., practitioners liable for call-up under the National Service Acts, may apply and if appointed will be granted indefinite deferment of call-up on completion of minimum tour of 2 years. Salary scale £950–£1450 a year.

Appointments on permanent basis with pension (non-contributory) 1/600th of final pensionable emolument for each completed month of service or on contract for 3 years' resident service with gratuity (taxable) of 22½ % of salary for each 3 months' service. Candidates from National Health Service may retain superannuation rights during service abroad (up to 6 years) and receive gratuity of 20 % of salary on leaving overseas employment. Only permanent officers are members of Her Majesty's Overseas Civil Service. Free unfurnished quarters or allowance of £100 a year in lieu when attached to an institution. In districts where quarters available rent payable at 12 % of salary with maximum £12 10s. a month depending on whether quarters are furnished. Free passage for officer, wife, and children under 18 years up to 5 persons in all. Assisted passages for officer and wife on leave.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD. 117/30/01).

Hospital Services: Non-Medical Appointments

DUMFRIES. ROYAL INFIRMARY. Senior Technician in Biochemistry required for New Area Laboratory at above Infirmary.

Applications, with names of 2 referees, to be sent before 12th July, to Secretary, Royal Infirmary, Dumfries.

DUNDEE ROYAL INFIRMARY. Applications are invited from holders of A.R.I.C., or B.Sc., preferably with Honours, for appointment as HOSPITAL BIOCHEMIST (basic grade) in the Pathology Department associated with St. Andrews University Medical School. Whitley salary.

Apply Medical Superintendent.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY. Applications are invited for the following posts :—

(1) SENIOR MEDICAL PHOTOGRAPHER I. Salary scale £515–£665 p.a.

(2) MEDICAL PHOTOGRAPHER or TRAINEE (I.B.P. Prelim. or Inter. desirable). Salary scale £440–£545 p.a. or £150–£370 p.a.

Whitley Council conditions.

Applications, with names of 2 referees, to the Director, Department of Medical Illustration, Manchester Royal Infirmary, Manchester, 13.

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* **E.C.16A** *obtainable from the council. Mark envelope "Vacancy."*

COTSWOLDS. BROADWAY, WORCESTERSHIRE. Applications invited for Rural VACANCY due to resignation. List 927 (100 dispensing). Surgery may be available. Restricted area. Closing date 31st May, 1958. Full written details and E.C.16A from the Clerk, Worcestershire Executive Council, 29, Foregate-street, Worcester.

DALSTON, CARLISLE. Applications are invited for VACANCY (Rural) owing to resignation of practitioner at Dalston, near Carlisle. List at 1st April, 1958, 1673 (all dispensing patients). Residence and surgery may be available. Apply on Form E.C.16A by 30th May, 1958, to—

F. M. SMITH, Clerk to Cumberland Executive Council.
7, Chatsworth-square, Carlisle.

Experienced Jewish Practitioner seeks Partnership, London or Southern England. Ample cash capital available for house purchase. Would practitioners contemplating retirement please contact.—Address, No. 402, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Miscellaneous

AMENDED ADVERTISEMENT

British Medical Association. The Council of the British Medical Association invites applications from registered medical practitioners of both sexes for the post of Assistant Secretary. Preferential consideration will be given to candidates not over the age of 40. The salary will be £1850, rising by annual increments of £115 to a maximum of £2890 p.a. In exceptional circumstances the initial salary may be above the minimum of the scale. The Association superannuation scheme will apply on substantive appointment. The appointment will be for a probationary period of 6 months in the first instance and thereafter may be terminated by 6 months' notice on either side.

Applications, giving details of qualifications and experience and accompanied by the names of 3 persons to whom reference may be made, should be addressed to the Secretary of the Association at B.M.A. House, Tavistock-square, London, W.C.1, and must be received not later than 7th June.

Medical Subeditor.—The Lancet's editorial staff has a vacancy for a medical man or woman, senior or junior, with literary ability. The post is full-time, or nearly full-time, and the work is primarily the preparation of articles for the Press. Inquiries may be addressed to the Editor at 7, Adam-street, Adelphi, London, W.C.2.

Ex-Senior Registrar Teaching Hospital Anæsthetist available as Locum.—Address, No. 399, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Australia. Industrial Medical Officer required as Assistant Doctor by large Mining, Milling and Smelting Company in Mount Isa, Queensland. Wide general experience necessary, age about 35 years. Salary £A2000–£A2500 p.a. plus a variable bonus based on the price of lead at present amounting to £A225 p.a. Superannuation scheme.

Apply in first instance to MOUNT ISA MINES, LIMITED, Adelaide House, King William-street, London, E.C.4.

Required. Registrars or Senior House Physicians under age 35 with either 3 or more years' training in medicine or 3 or more years' training in paediatrics interested in moving permanently to areas in and near New York City for opportunities to practise in medical groups. Beginning annual salary $10,000, including loans for transportation if needed. Full details at interviews in London 1st, 2nd, and 3rd July, with physician from New York.—Make appointments through Sir ALLEN DALEY, 24, Edith-road, London, W.14.

Virologist with clinical interests, for U.S.A. University Department of Pediatrics. Knowledge of tissue culture and serological techniques. Some opportunity for teaching medical students and house-staff. Write curriculum vitæ, including details concerning references, anticipated salary, and availability. —Address, No. 401, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

S.R.N. required as Day Sister in private nursing home. Under 35 years of age. Live in.—Please apply: Matron, St. George's Nursing Home, 61, St. George's-square, Westminster, S.W.1. Telephone: TAT 3041.

Harley-street. Self-contained pied-a-terre for 1 doctor— 2 rooms, hall, bathroom, w.c.; c.h.w.—Apply Address No. 400, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, or ring LANgham 1565.

Southsea. Secluded position close to the sea-front, shops and town centre. First-class Nursing Home for sale as a going concern: 7/8 bedrooms, reception, 2 bathrooms, conservatory, &c. Excellent nursing and catering equipment. Turnover about £140 per week; scope for extension. Realistic price freehold. Recommended.—Agents: HAMPTON AND SONS, 6, Arlington-street, St. James's, S.W.1 (Telephone: HYD 8222).

Part-time Consulting Rooms to be Let in Harley-street. Rents from £50 per half-day session. Apply: ELLIOTT, SON AND BOYTON, 86/87, Wimpole-street, London, W.1. WEL 8367.

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 98, Victoria-street, S.W.1 (VIC. 0141), who are specialists.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

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Rheumatoid arthritis; bronchial asthma; dermatoses; allergic disorders; other conditions amenable to therapy with corticosteroids.
Oral tablets of 4 mg., scored for easy division.
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FENOX NASAL SPRAY is an efficient alternative to Fenox Drops which offers greater convenience of administration to the patient.

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FENOX NASAL SPRAY	FENOX NASAL DROPS
Phenylephrine Hydrochloride, B.P. 0.5% ½ fl. oz. plastic squeeze bottle— Basic N.H.S. price 2/-	Phenylephrine Hydrochloride, B.P. 0.25% Naphazoline Nitrate, B.P. 0.025% Chlorbutol, 0.5% ½ fl. oz. Dropper Bottle— Basic N.H.S. price 1/8d.

Fenox nasal spray

Further information gladly sent on request

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